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STUDIES OF THE EFFECTIVENESS OF PARAMEDICAL PERSONNEL USAGE IN MEDICAL CARE DELIVERY

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November 1977

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The United States as a whole is currently undergoing a crisis in medical care, primarily in terms of costs and capacity. One approach to solving these problems is to use paramedical personnel as part of an integrated delivery system, but in doing so one is likely to meet with behavioral and organizational obstacles. In this research, the degree to which different categories of medical and paramedical professionals are used in various

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ABSTRACT

The United States as a whole is currently undergoing a crisis in medical care, primarily in terms of costs and capacity. One approach to solving these problems is to use paramedical personnel as part of an integrated delivery system, but in doing so one is likely to meet with behavioral and organizational obstacles. In this research, the degree to which different categories of medical and paramedical professionals are used in various organizations is measured and organizational factors leading to successful utilization identified. The study concentrates on medical systems within the United States armed forces, as these are systems relying extensively on paraprofessionals, where problems in utilization have been noted. Specifically the study determines those tasks currently performed by various paraprofessionals and compares this task list with perceived abilities, as determined by the paraprofessionals themselves, by their medical co-workers, and those persons who train the paraprofessionals. A number of organizational parameters, such as degree of autonomy, task delegation methods, degree of cooperativeness, and amount of interaction among different members of the medical team are measured. Career patterns and motivational factors are determined. Finally, major problem areas are identified and corrective actions suggested.

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Chapter 1. INTRODUCTION

I. The Problem of Physician Supply

Few would disagree with the observation that health care in the U.S. is in a state of transition. The nature of patient demands and expectations is changing; new methods of delivering care are being developed, new not only in methods and techniques, but in the variety of the providers as well; maldistribution and shortages of some physician skills limits the amount and quality of care available in some areas; and costs are increasing, leading to efforts to improve the efficiency of the delivery system. These observations also characterize the military health delivery system in the U.S. In addition, certain unique aspects of the U.S. Military System exacerbate the nature of these problems.

Due to both legal and national security requirements, the military must develop and maintain a relatively large and comprehensive health care delivery system. The system must be capable of directly providing a comprehensive range of care to all active-duty personnel and must be prepared to mobilize quickly and deploy medical care units on a scale adequate to meet the requirements of large-scale warfare. In addition, it is the responsibility of the military to provide health care, either directly or through coinsurance, to dependents of active-duty personnel, retired military personnel and their dependents, and certain other non-active-duty individuals. Current estimates place the number of potential patients for the military delivery system at about ten million worldwide.

Couple this level of potential demand with the changing nature of the supply and costs of health providers resulting from the transition to an all volunteer military force, and the problems of matching supply with

demand become significant. We have recently witnessed the elimination of the physician draft, the primary means of securing relatively low-cost, high quality physicians for the military. The result has been a significant increase in the costs required to induce physicians to enlist in the military. Further, the recruitment of sufficient physicians to fill the non-specialty role of general medical officer (GMO) has become difficult, leaving a void in the primary care area, especially in the ambulatory care segment of the system.

Some of these concerns are quantified in the health personnel all-volunteer task force report [Ref. 59], issued on 1 April 1973. The size of the population groups requiring health care was estimated to rise from 9.76 million people at the end of fiscal year 1972 to 10.13 million at the end of fiscal year 1977, with the increase in retired personnel and dependents of retired personnel more than making up for the drop in active duty members and their dependents [Ref. 59, p.6]. Major problems were foreseen in providing enough physicians to staff the system. Since World War II, retention of military physicians, dentists, and other health professionals has been among the most difficult personnel problems for the services, and since over two-thirds of physicians on active duty were serving through the "doctor draft," the services were clearly facing a major crisis in medical personnel. Not only were the numbers of physicians available to the armed forces likely to be in short supply, but [Ref. 59, p.13] "The general medical officer, on whom the services have historically relied to provide a substantial amount of primary care, will probably disappear within 3-5 years in the military." Thus, an especially acute crisis in the primary care area seemed to be imminent.

II. The Advent of Paramedical Programs

In response to this problem, the services initiated a number of programs to recruit and retain medical personnel (more scholarships, founding of the Uniformed Services University of the Health Sciences, pay incentives) and to increase the utilization of those physicians who were available, particularly in the primary care area. The procurement of paraprofessional medical personnel, particularly physician assistants (PAs) nurse practitioners and nurse clinicians (NPs)[1] , and AMOSISTs/NAMICs,[2] was a major part of the program to increase physician productivity. Programs were undertaken to provide over 1,100 PAs and over 400 NPs plus a substantial number of AMOSISTs and NAMICs by 1977. Each of these new roles involves non-physician health care personnel who have received some degree of specialized training, usually both didactic and on-the-job, over periods of six weeks to twenty-four months, and who upon completion of training are assigned to positions requiring direct care delivery to military and/or dependent patients.[3]

The potential payoffs of utilizing these new professionals appear to be tremendous in terms of cost savings, quality of care, patient satisfaction, and provider satisfaction. However, the potential large scale usage of non-physicians to provide direct care raises a number of questions. There are three general areas of concern: (1) the economics of the new methods of health delivery, (2) the quality of care provided by these new roles, and (3) the effectiveness of efforts to define roles for these new personnel and to integrate these new roles in to the current military delivery system. The first area has been investigated in some depth, as discussed later in this paper. The second area, although of considerable

academic and professional interest, seems to be of lesser practical concern, at least under current restrictions in the use of the new roles. The problems of quality measurement and assurance are of tremendous importance over the long range, but current practices seem to be workable and useful in the short range. The third area, however, is proving to be a difficult one in actual practice, as evidenced by top level attention in the Department of Defense. On 5 March 1975 the Honorable W. P. Clements, Deputy Secretary of Defense, stated that "It appears there will be a continuing need for physician assistants--of some sort. What specific role they should perform and the particular training needed to fulfill that role are issues which require considerably more examination. I want a thorough study of these questions to be undertaken within the next six months." [Ref. 17]. In response to this directive, the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) initiated discussions with a number of persons involved in health care research at the Naval Postgraduate School, Monterey, California. The primary concern expressed by OASD (MSRA) was a definition of appropriate roles for all members of health care teams in general, as well as for physician assistants in particular. A number of associated concerns were also mentioned, such as the effects of current organizational and military policies, such as rank policies for various members of health care teams, on armed forces medical care.

III. Outline of Research Goals

The emphasis of the research project is on measuring the degree to which different categories of medical or paramedical personnel are used

in various organizations, then on identifying factors leading to successful utilization. Specifically, the primary questions to be addressed by the study are as follows:

1. What are the current tasks being performed by the various physician-extender roles in the military? Essentially, we are asking how are these personnel currently being utilized.
   a. What medical tasks do they currently perform?
   b. What kinds of settings are they currently working in (emergency room, clinics, field dispensaries, etc.)?
   c. What types of patients do they see (acute, chronic, routine checkups, dependents, active duty, retired, etc.)?
2. What tasks are these personnel capable of handling by virtue of their training and/or experience? What is their potential?
   a. What do the trainers of these personnel see as the types of tasks their graduates can adequately perform?
   b. Where (in what tasks) do discrepancies exist between what these personnel are currently assigned to and what they are trained to do? Are they underutilized or overutilized in terms of the training they have received?
3. What organizational conditions (rules, structure, morale, status, etc.) exist which affect the optimal utilization of these personnel in the delivery of medical care?
   a. What are the conditions under which these personnel are being effectively utilized?
   b. What conditions appear to constrain their effective utilization?
   c. How are organizational conditions related to the satisfaction of these personnel?
4. What are the differences among the various types of extender roles in terms of current utilization and potential by virtue of training?

These four broad questions form the focal interest of the study, The intended goals are to gain insight into the nature of current patterns of

utilization of physician extenders in the military, to identify potential problems inherent in those patterns, and to suggest, in a preliminary way, those avenues most promising for improvement and/or those requiring further study.

IV. Outline of the Report

Chapter 2 of this report discusses each of the major paramedical roles included in this study, the PA, the NP, and the AMOSIST. The purpose of this chapter is to review the literature on each role, focusing on the potential for the role. Chapter 3 is a review of the literature on organizational effectiveness, human behavior, and organizational design, particularly as applied to health care settings, and outlines the questions addressed in this research. Chapter 4 discusses the methodology used.

Results of the study are presented and discussed in Chapter 5. Chapter 6 summarizes main conclusions, implications, and thoughts on future research suggested by this work.

FOOTNOTES

1. In the military health delivery system, a variety of titles are employed for many of the roles discussed, particularly the "nurse practitioner," "chronic illness nurse," "pediatric nurse clinician," etc. Moreover, some of these terms are also used to denote personnel with different types of skills. We shall use the term "nurse practitioner" (NP) to refer to all such roles, as defined in Chapter 2 of this report.

2. The terms NAMIC in the Navy and AMOSIST in the Army refer to corpsmen who have received medical training to an extent necessary to allow work as the primary deliverer of medical care in certain minor illness settings. These personnel are also known by a variety of names. We shall use the term AMOSIST to refer to all such roles.

3. In this report, PAs and NPs are collectively referred to as "mid-level practitioners," or MHPs. These MHP roles, along with the AMOSIST/NAMIC role, are called "paramedical personnel" or sometimes "paramedics." The physicians, nurses, and corpsmen are referred to as "traditional medical roles." All these personnel are collectively discussed under the term "providers of medical care," or simply "providers."

Chapter 2. THE PROMISE OF PARAMEDICAL PROFESSIONS

In virtually any book or article on medical care systems published recently, one can read statements concerning the current and ongoing crisis in medical care delivery, the major facet being the enormous rise in costs in recent years, particularly hospitalization costs, the increasing involvement of government, primarily the federal government, in various aspects of health care, and concern over possible maldistribution of medical skills. These concerns have lead to the development of new, hopefully more efficient and effective, modes of care delivery in civilian, as well as military, health care systems. One trend has been the development of new types of health practitioner, particularly the physician assistant (PA) and the nurse practitioner (NP). The rationale behind the development of each of these roles has been to develop a professional who can competently perform some of the tasks traditionally performed by physicians, but who don't require training nearly as extensive or expensive as that of a physician. These arguments were articulated by President Nixon in a special message to the Congress on February 18, 1971, when he stated:

> "One of the most promising ways to expand the supply of medical care and to reduce its cost is through a greater use of allied health personnel, especially those who work as physicians' and dentists' assistants, nurse pediatric practitioners, and nurse midwives. Such persons are trained to perform tasks which must otherwise be performed by doctors themselves, even though they do not require the skills of a doctor. Such assistance frees a physician to focus his skills where they are most needed and often allow him to treat many additional patients."

In the next two subsections these roles are defined. For convenience we will use the term "mid-level health practitioner" (MHP) to refer jointly to PAs and NPs We realize that some groups may object to these terms but the lack of generally accepted terminology makes some such choice

Table 2.1 Summary of Selected MHP Programs

Sponsoring Institution	Length of Training (months) Classroom	Clinical	Preceptorship
I. MEDEX Programs			
Dartmouth College, Hanover, NH	--- 3	---	9
Univ. of N. Dakota, Grand Forks, ND	--- 3	---	9-12
Univ. of Utah, Salt Lake City, UT	--- 3	---	9-12
Univ. of Washington, Seattle, WA	--- 3	---	9-12
II. Physician Assistant/Associate Programs			
Bowman-Gray, Winston-Salem, NC	9	12	3
Duke Univ., Durham, NC	9	15	0
Yale Univ., New Haven, CT	9	15	0
Drew, Los Angeles, CA	3	9	3
Phoenix Indian Health Svc, Phoenix, AZ	--- 12	---	12
Alderson-Broaddus, Philippi, WV	33	8	1
III. Family Nurse Practitioner Programs			
Univ. of Calif., Davis, CA	--- 12	---	6
Medical Care Development, Inc. Augusta, ME	--- 4	---	8
Univ. of No. Carolina, Chapel Hill, NC	--- 6	---	6
IV. Pediatric Nurse Practitioner Program			
Good Samaritan Hosp., Phoenix, AZ	--- 4	---	0
Northeastern Univ., Boston, MA	--- 4	---	0
Univ. of Virginia, Charlottesville, VA	2	2	0
Univ. of Washington, Seattle, WA	3	0	6
Univ. of Colorado, Denver, CO	--- 4	---	0
V. Child Health Associate Program			
Univ. of Colorado, Denver, CO	--- 24	---	1

Source: Ref. 19, Appendix II

necessary. The term "mid-level health practitioner" seems better than either "new health practitioner" (cf. Nelson et al, 1975) or "paramedic," since even newer roles are now emerging and since "paramedic" often connotes, or at least includes, fairly low skill roles. The literature regarding their performance in actual practice is then reviewed. A third type of paraprofessional, the AMOSIST/NAMIC, which is of particular concern in this study, is then introduced and discussed.

I. The Physician Assistant

The concept of the physician assistant (PA) was first developed by Dr. Eugene Stead of Duke University, who established the first PA training program at Duke in 1966. By 1971, 14 programs were providing training, while by 1975 the number of PA programs accredited by the AMA had grown to more than 45, including two programs operated by the armed forces. These programs are expected to graduate over 1200 PAs annually.

The American Medical Association officially defines a physician assistant as a "skilled person qualified by academic experience and practical on-the-job training to provide patient service under the supervision and direction of a licensed physician who is responsible for the performance of that assistant." The term "physician assistant" is used in practice, to refer to a number of new health practitioners, such as physician assistant, child health associate, MEDEX, physician associate, and others. There are a variety of programs engaged in training PAs. The Comptroller General [Ref. 19] documents programs varying in length from three months of didactic and nine months of preceptorship training to thirty-three months of classroom, eight months of clinical, and one month of preceptorship training (see Table 2.1). The specific skills acquired by graduates of the

various programs vary, but the graduates of these programs perform essentially the same functions [Ref. 19, p. 5]. A fairly typical task list, this one pertaining specifically to Navy PAs is given in Table 2.2.

The PA programs in the military were initiated largely in response to the anticipated physician shortage in the all-volunteer armed forces (cf. Clements, Ref. 17). The Air Force PA program was approved in 1970 and the Army and Navy programs in 1971. In the fall of 1973 the Navy and Air Force programs were merged. The education programs of the services are essentially the same, involving twelve months of didactic training taught in military facilities, Fort Sam Houston for the Army, and Sheppard Air Force Base, Texas, for the Navy and Air Force, while the second twelve months is spent in a rotating clinical practicum at a military hospital of the student's parent service. After graduation the programs begin to show some differences. The Army PA, who is appointed as a warrant officer, is assigned to duty in a battalion-size troop unit as a replacement for the physician formerly assigned as the battalion surgeon. The Navy PA, who is also appointed to warrant officer status, is assigned to a Navy Treatment Facility in any of a variety of positions. Typically, but not exclusively, he is assigned to an outpatient facility dealing with active duty troops. In the Air Force the PA remains an enlisted man in one of the top three enlisted grades, and receives bonus pay. He is generally assigned duty in a general therapy or family practice clinic of an Air Force hospital (Page, Ref. 60).

Table 2.2 Functions of Navy Physician's Assistant

Take and record elements of past medical history.

Take and record elements of past family history.

Take and record elements of past systems review.

Take and record elements of past health habits, environmental data, and occupational data.

Take and record elements of past interval history.

Evaluate computer-generated or patient self-administered history for significant entries.

Review, record, and verify details of patients therapeutic program.

Review pertinent history for presentation to physician supervisor.

Perform general physical examination.

Evaluate growth and development in pediatric patients.

Perform pertinent screening examination in acutely ill symptomatic patient for presentation to physician.

Evaluate and record pertinent abnormalities.

Evaluate patients during prenatal visits.

Evaluate patients suffering from acute injury.

Initiate supportive management.

Perform visual testing, acuity testing, and determination of visual fields.

Perform tonometry.

Draw arterial blood samples.

Draw venous blood samples.

Perform blood counts.

Perform urinalysis.

Perform stool examinations.

Inject test substances for diagnostic determinations, including BSP, IVP.

Perform EKG and interpret EKG tracing.

Perform pulmonary testing.

Instruct patient on obtaining specimens.

Perform skin tests.

Perform bacteriologic smears and cultures.

Administer injections of appropriate medications.

Administer immunizations.

Carry out program of chronic disease management.

Clean and dress wounds.

Table 2.2 (Continued)

Suture wounds.

Remove sutures.

Apply casts.

Apply splints.

Apply topical dermatologic therapy.

Administer inhalation therapy.

Catheterize patients.

Perform ear irrigations.

Counsel patient with regard to health habits, exercise, tobacco and alcohol.

Assess family psychosocial resources.

Explain projected tests and therapy.

Perform supportive counseling.

Assist patient in understanding disease processes.

Assist families in adjusting to illness.

Instruct patients with regard to diet, physical therapy, and the use of physical adjuncts to therapy.

Administer physiotherapy.

Provide prenatal counseling.

Provide child care instructions.

Provide telephone contact and advice to patients.

Maintain clinical records.

Inventory clinical supplies

Fill out forms for school, work, etc.

Schedule tests.

Schedule hospital admissions.

Schedule return visits.

Discuss progress reports with physician.

Discuss progress reports with patients.

Check on reports of diagnostic studies.

Document hospital care.

Administer intravenous fluids.

Insert feeding tubes.

Change catheters.

Fill out diagnostic test requests.

Remove fecal impactions.

Serve as surgical assistant.

Table 2.2 (Continued)

Perform lumbar puncture.

Perform gastric lavage.

Insert intracaths.

Perform superficial debridement.

Remove foreign bodies as indicated.

Drain abscesses.

Remove casts.

Change and remove dressings.

Remove drains.

Perform thoracentesis.

Apply nasal packing.

Perform proctoscopy examinations.

Apply traction devices.

Perform audiometric examinations.

Refer patients to social agencies or other health care facility.

Administer local anesthesia.

Prepare discharge summaries.

Source: Custes, VADM P. L. [Ref. 20].

II. The Nurse Practitioner

The nurse practitioner (NP) role, like that of the PA, was created in part to relieve physicians of some of their traditional duties. In contrast to the PA, however, the NPs see themselves as co-workers with, rather than subordinates to the physician. Whereas the PA role is a new one, specifically created to fill a perceived need to deliver routine procedures, the NP evolved by expanding the traditional role of the nurse into some procedure-oriented areas. The NP is viewed as retaining those specific skills traditionally recognized as nursking skills by the profession, namely in counselling and education, emotional and psychological support, and integrating various procedures into a total package of patient management.

Extending the role of the nurse in various specific areas is not a new concept. Nurses with the Frontier Nursing Service in Kentucky, for example, have performed extended role functions for many years [Russell and Williams, Ref. 70, p. 11]. The formal crystallization of the NP role as distinct from extended or specialty nursing took place in the mid and late 1960's [cf. Russell and Williams, Ref. 70, and Andrews et al, Ref. 5]. NP training programs often vary in length, subject matter, and terminology, giving rise to some confusion concerning the precise role and abilities of a nurse practitioner. The most widely cited definition seems to be that of the Congress of Nursing Practice, which defines a nurse practitioner as:

> "...A licensed professional nurse who provides direct care to individuals, families and other groups in a variety of settings including homes, institutions, offices, industry, schools, and other community agencies. The service provided by the nurse practitioner is aimed at the delivery of primary, acute or chronic care which focuses on the achievement, maintenance, or restoration of optimal functions in the population. The nurse

practitioner engages in independent decision making about the nursing care needs of clients and collaborates with other health professionals such as physicians, social workers, and nutritionists, in making decisions about other health-care needs. The nurse practitioner plans and institutes health care programs as a member of the health care team." [Quoted in Fottler et al, Ref. 32, p. 1].

This somewhat broad definition is amplified by Cynthia Kinsella, former Dean of the School of Nursing, City College of New York:

"The distinguishing characteristic of the clinical nurse specialist, no matter in what setting she is found, is the high degree of discriminative judgment she uses in assessing nursing problems, determining priorities of care, and identifying nursing measures to achieve therapeutic goals...in a study done for the New York City Department of Hospitals, Dr. Kinsella identified five major aspects of the nurse clinician's role: 1. As an expert in a specialized area of nursing she gives direct care to patients and serves as a role model of excellence in practice. 2. She serves as a guide to other personnel, sharing her knowledge through tour-to-tour reports and unit conferences. 3. She is an innovator and an agent of change, using her skills in interpersonal relations to identify the problems of and barriers to individualized care and taking appropriate steps toward their resolution. 4. She works to develop a spirit of inquiry in staff. 5. She serves as an internal source of consultation in problems relating to her specialty." [Ref. 77, cited in Ref. 70, p. 15].

Within this broad context, a number of NP specialties have evolved, including OB/GYN, nurse midwife, pediatrics, advanced operating room NP, public health, intensive care, psychiatric/mental health, anesthesiology, and ambulatory care. The armed services currently sponsor a variety of training programs in this area. Some summary statistics on these programs are given in Table 2.3.

III. Performance of PAs and NPs (MHPs) in Practice

As usage of PAs and NPs has increased, a number of areas of concern have evolved. These can be classified as economic issues, quality of care issues, issues of patient acceptance, issues of physician acceptance, issues

Table 2.3 Armed Forces NP Training Programs

	ARMY			NAVY			AIR FORCE		
Type of NP	G*	LT*	AG*	G*	LT*	AG*	G*	LT*	AG*
OB/GYN	**	5.1	32	50	8	0	110	2	**
Midwife	**	8.8	4	0	-	-	52	8.6	12
Pediatric	**	5.0	32	50	4	6	129	4	22
Advanced Operating Room	**	8.7	6	0	-	-	0	-	-
Public health	**	6.7	40	0	-	-	0	-	-
Intensive Care	**	5.0	48	0	-	-	0	-	-
Psych.	**	5.0	30	0	-	-	0	-	-
Anesthesiology	**	24	30	0	-	-	0	-	-
Ambulatory	**	5.0	32	0	-	-	0	-	-

*Headings

G = Eventual manning goal

LT = Length of the training program (months)

AG = Estimated annual number of graduates

** = Not yet determined

Source: OASD (H&E) Report [Ref. 59], pp. 161-169.

pertaining to uniform, recognized definitions of the roles, determination of appropriate training and background for PAs and NPs (collectively called MHPs), legal status of MHPs, political problems faced by MHP programs, and problems unique to military MHPs, such as rank and career issues. These are discussed in turn below.

III. 1. Economic Issues

The first economic question to be answered is that of the economic viability of the MHP concepts. Do PAs and/or NPs in fact deliver medical care at less cost than physicians? The answer to this question is unquestionably "yes," at least in large practice settings where the MHPs are allowed to practice relatively freely. Using MHPs certainly increases physician productivity, and most studies indicate that the savings of physician time more than offset the cost of MHP employment. Cohen et al [Ref. 19, p. SVI] indicate that MHPs "were able to manage at least two thirds, and in some cases a higher fraction, of the patients assigned to them without consulting the supervising physician. In addition, of the visits where physician consultation was sought, about half were managed without the physician actually examining the patient." Cohen and her coworkers (pp. 94-103) discuss nearly a dozen studies of NPs and another four studies of PAs in ambulatory care settings, nearly all of which document successful delegation of tasks to and the resulting efficiencies of hiring PAs and NPs. Fairly typical results are cited by the Comptroller General [Ref. 19, p. 33] which indicate that as a result of hiring PAs and other practitioners "the number of patients seen has increased while the physicians' total on-the-job time has remained the same or decreased." Similar

results are reported for MHPs, primarily NPs, in settings other than ambulatory care: pediatrics, school nurse, and OB/GYN. Studies by Merenstein et al [ref. 55], Lee et al [Ref. 48], and Turner et al [Ref. 81], however, do report low productivity levels or ambiguous results for NPs in some settings.

The question of economic viability cannot be answered by establishing merely the existence of increased efficiency; the magnitude of the increase must be shown to be great enough to offset the costs of employing the MHP. Nelson et al [Ref. 59] specifically discuss the financial impact of PAs and document that "ten of the twelve practices in the study experienced substantial gains of estimated revenue over expenses." The two practices not showing gains showed only relatively small losses. These observations lead the authors to conclude that "the addition of a MEDEX...has proved to be an economically sound decision." Schiff et al [Ref. 74] indicate that adding an NP was profitable to a pediatric practice. The addition of the NP was associated with an 18.8% increase in the number of patient visits; the net income resulting from the NP exceeded her salary by the fifth month of her association. Lewis and Resnik [Ref. 50] find "substantial" savings associated with using NPs in managing chronic illness in adults. Rosoff et al [Ref. 68] documented substantial savings in using NPs to provide home care for postoperative patients discharged earlier than usual. Patient savings were estimated at $135,000 to $150,000 per year, depending on daily hospital rates and whether the NP was employed full- or part-time. Yankauer et al [Ref. 88] estimate that NPs in private pediatric practice generate income on the the order of $2500 to $3000 over and above their current net salaries (1971-72 dollars); only 6 of the 26 NPs in the study failed to

generate enough revenue to cover their costs. They estimate training costs of the NPs studied at $3,197 per student, indicating that the training investment yields a substantial return. Garfield et al [Ref. 34] discuss a revised delivery system utilizing an NP staffed health evaluation service. The new system reduced costs to the system by $32,500 per 1000 entrants, as well as substantially improving patient access, decreasing waiting time for appointments, and reducing physician time and costs for entry work-up by 70 to 80 percent. This work was done in a prepaid group practice (Kaiser-Permanente, Oakland, California). Golladay et al [Ref. 36] indicate that "the empirical analysis suggests that introduction of a physician extender could substantially reduce the cost of delivering a vector of medical services and increase the productivity of the physician." These authors find, however, that very small practices, serving less than 140 patients per week, could not appropriately use a physician extender. Although this concept of there being a lower limit to the size of a practice which can profitably support a PA is sensible, the precise magnitude of that limit is not clear. Nelson et al [Ref. 58], for example, find no statistically significant relationship between profitability of the PA and such variables as town population (all study sites were predominantly rural, private medical practices).

These and similar studies have been criticized on the grounds that imputed or secondary costs may not be accounted for. For example, if an MHP tends to order more or more expensive laboratory tests to cover his relative lack of expertise, or if he tends to rely on excessive physician consultation or referral, the total cost of his employment may exceed the value of the physician time he replaces. The Kaiser Foundation Report

[Ref. 43] contains a very complete and detailed analysis of these and other potential cost factors, and concludes that the five PAs currently in the system studied (Kaiser-Permanente in Portland, Oregon) result in annual savings of at least $15,000 per PA, and perhaps as much as $34,000 per PA, measured in 1975 prices. If additional PAs were hired, up to the effective limit of their utilization, then the total systems savings would be on the order of $325,000 per year. About 30% of these savings would result from the so-called "nurse differential." Physicians are largely assisted by registered nurses and PAs by nurses' aids in this particular setting; the "nurse differential" results from the differences in salaries between these groups. The transferability of this portion of the savings to other settings is debatable, but even excluding this leaves a substantial cost savings from hiring PAs. In summary, one must admit that many of the studies cited here were not rigidly controlled and most were performed by advocates of the MHP concept. Nevertheless, one cannot help but be impressed by the uniformly positive results.

By and large the cost savings realized by using the MHPs are not passed on directly to the public, in that the prices charged for services performed by an MHP are identical to those charged if a physician does the work [Comptroller General Report, Ref. 19, p. 33]. There is, in fact, some feeling that a dual fee system would imply that the MHP delivers "second class" care. Even assuming the continuation of a single fee system, however, it seems reasonable that the use of lower cost resources in care delivery would eventually lower, or at least decrease the rate of growth of the cost of care to the public.

A more serious obstacle to the increased use of MHPs, especially for

prepaid plans and the military system, is the fact that physicians are observed to delegate inefficiently [cf. Golladay et al, Ref. 36]. Specifically, MHPs tend to be used less than economic considerations would indicate. A number of legal, professional, and behavioral obstacles contribute to this, of course, but in many large group settings and in the military, a major problem is the lack of economic incentives to those who structure the system. The system as a whole may save money by using MHPs, but the physician in charge of structuring individual components of the system must have a share of his savings passed on to him, perhaps in the form of increased salary, more leisure or research time, better facilities, etc., before he is economically motivated to hire MHPs.

Finally, some third party payment plans may restrict payments for non-physician supplied services. For example, the Social Security Administration does not provide payment for MHP services under Part B of Medicare [Ref. 19, p. 35]. This particular restriction may be honored in the breech more than the observance, but this nevertheless provides an example of a potentially potent restricting force.

III. 2. Quality of Care Issues

Clearly the economic and productivity arguments in favor of using MHPs cannot be considered without simultaneously examining the quality of care they deliver. If the care delivered is of lesser quality than that delivered by the physician, then one must define trade-off criteria, the net effect of which would be to limit the MHP to a more restricted role than economic considerations alone would indicate.

The problem of measuring the quality of care, unfortunately, is extremely

difficult, as outlined by Giauque [Ref. 35] and discussed by Donabedian [Refs. 26 and 27] and Flagle [Ref. 31]. Briefly, one would like to examine the outcomes of a medical system, i.e., what actually happens to the patients over time, then judge the quality of care delivered on the basis of the outcomes. When trying to use outcomes to measure quality one must resolve a number of issues. First, which outcome measures are to be used, and how are they to be combined? In treating patients with certain chronic disabilities, for example, treatment strategies can depend strongly on whether one considers morbidity or mortality of primary importance. Second, even if one succeeds in devising a satisfactory unitary measure, the uncertainty and complexity of medical processes make it difficult to determine an optimal strategy for delivering care. Third, even if an optimal strategy were available, the diagnostic skills, treatment skills, patient management skills, even the mechanical skills (e.g., how quickly and easily can a hypodermic needle be inserted) of the medical practitioners involved in the delivery system can have a great impact on the outcomes. Thus, a standard of comparison is required against which actual outcomes can be measured. Ideally, the standard would be quantitative, would control for the pre-existing condition of the patient, and would allow for the inherent uncertainty in any medical intervention. A final problem with any quality control system which depends on outcome measures is the time delay often required for some outcomes to become manifest. The success of some treatments is not fully known until years have passed. Although it is possible to conduct an evaluation based on outcome measures of some types of disorders [cf. Giauque, Ref. 35], very little has been done. Kaiser-Portland [Ref. 43, pp. 108-117] conducted a study in which outcome measures were briefly examined; results indicate

that PAs in the study perform impressively well compared to the physicians. In episodes involving four specific diseases, only 0.9% of the PA patients developed complications, compared with 3.4% of the physician patients. These data are not conclusive (there is no control, for example, of the relative difficulties of the cases assigned to the physician and the PA), but the results do indicate that the PA is probably holding his own in delivering quality care. Wolcott [Ref. 86] discusses an outcome review comparing a physician-staffed system to MEDEX-staffed and AMOSIST-staffed systems. He concludes that there is no significant difference in recovery rates or time lost from work among patients treated for acute respiratory complaints by the three systems. Turner et al [Ref. 82, Section V, Exhibit 3] cite some preliminary data on comparative control of hypertension by physicians and NPs; although the results are incomplete, it appears that the NPs are at least as successful as physicians in reducing the degree of hypertension in patients.

Due to the difficulty of using outcome measures directly, many quality control systems are based on process standards. The processes or procedures followed in a given setting or case are examined, generally by experienced medical personnel, for "reasonableness." Although this idea is the basis of case review and record review systems currently in wide use, it too has weaknesses. First, the information available to the reviewer is generally incomplete, and second, the standards of "reasonable" care are subjective, thus subject to bias and shortcomings of the reviewer and the medical community [cf. Donabedian, Ref. 26]. Those process-based quality studies of MHPs which have been published largely indicate that the MHP seems to be

doing at least as well as the physician. Cohen et al [Ref. 18, pp. 77-107] review findings related to quality in a number of MHP studies. The general conclusion is that both NPs and PAs can and do deliver care in their areas of competence of comparable or better quality than physicians. The Comptroller General [Ref. 19, p. 115] indicates that "the PA practices conservatively, and that in deciding whether to consult the supervising physician the PA tends to err on the side of caution." Duttera [Ref. 28] indicates that physican extenders provide good quality care as measured by both diagnostic appropriateness and therapeutic appropriateness scales. Komaroff et al [Ref. 45] describe a setting in which PAs used protocols to manage diabetic and hypertensive patients in outpatient clinics, and concludes that PAs can safely and effectively be used in such a manner.

A third approach to quality assurance focuses on systems standards. That is, the resources of the system must meet various predetermined standards. The major weakness of this approach, of course, is that there is no direct link between the resources of the system and the care that is actually delivered. At best, one can say that certain resources are necessary but not sufficient to deliver good quality care. The major advantage of systems criteria is that they are relatively easy to apply. Perhaps the best example of systems standards as applied to MHPs is the establishment and acceptance of certifying examinations, specifically that designed for PAs. Other structure standards which have been applied require given ratios of physicians to PAs and NPs, specify the nature of the supervisory relationship, and so forth. There has been no work, however, demonstrating the necessity or utility of many of these restrictions.

III. 3. Issues of Patient Acceptance

Assuming MHPs are economically justifiable and that they deliver adequate quality of care, one must still examine the patients' acceptance of the new roles. If a substantial number of patients are reluctant to see MHPs then one clearly faces difficulties in introducing the concept.

Very briefly, review of the literature indicates that patient acceptance is not a major problem. Both NPs and PAs seem to be accepted readily by nearly all patients, as measured by patient surveys, unsolicited comments, lack of complaints, and decreased number of broken appointments. Most of the references discussed in the preceding two sections make comments about patient acceptance, nearly all of which are positive. No attempt is made here to summarize their observations in detail; rather a few more-or-less typical results are discussed, and some factors regarding the MHPs employment situation which influence acceptance are pointed out.

Garfield et al [Ref. 34] survey satisfaction among patients, physicians, and NPs and find that among patients there was "greater satisfaction in the new system (i.e., the NP-staffed system) with its decreased waiting time for appointments." Physicians were equally divided in their preference for the traditional and the NP-staffed systems, while 83% of the NPs preferred the new system. Russel and Williams [Ref. 70], in their study of Army NP practices, find that patients believe that NPs spend more time with patients than physicians, help patients understand their condition and treatment better, and are easier to see, as measured by the length of waiting time. Nearly all patients are satisfied with the interest shown and care delivered by NPs, and would recommend NPs to family and friends. For routine visits, far more patients would choose care by an NP over care by a physician. Yankauer et al

[Ref. 87] report that pediatrician assessments of patient acceptance of pediatric NPs were uniformly enthusiastic, and cite at least two instances where mothers were reported to have selected a pediatrician because he worked with an NP. Nelson et al [Ref. 57] surveyed patients who had personal experience with graduates of the Dartmouth MEDEX program. Very high percentages of patients (on the order of 85 to 95 percent) were very satisfied with the MEDEX's services, his competence, and his professional manner. More than two-thirds (71%) indicated that the quality of care had improved since the MEDEX joined the practice, while the remaining 29% reported no change. About 80% reported shorter waiting times, and more than half (57%) felt that the physician's staff now spends more time with them. Four fifths (83%) of the patients definitely would want the MEDEX to participate in their care again, and an additional 6% probably would. Only 1% would not want to be seen by him in the future. Cohen et al [Ref. 18, pp. 56-70] discuss a number of patient acceptance studies and conclude that "a synthesis of the findings from these studies suggests that consumer satisfaction with care by MHPs in general is as great as that with care provided by physicians."

A number of factors concerning the MHP himself and the setting he is used in have been found to influence patient acceptance. The Comptroller General [Ref. 19, p. 30] reports "a significant difference...between acceptance by patients unfamiliar with the physician extender and by those who have received care from an extender." Cohen et al [Ref. 18] summarize a number of studies, both among prospective and actual MHP patients, which largely bear this out, although differences in methodology make direct comparisons among the studies difficult. Golladay et al [Ref. 36] feel that patient acceptance depends strongly on (1) attitudes of the original health

care team; (2) the professional demeanor of the practitioner; and (3) the clear recognition of the patient's gains from delegation, such as less hurried care, more thorough workups, and less begrudged counselling. Cohen et al [Ref. 18] add such factors as the manner in which the MHP is introduced to the practice, present availability of health care, severity of the health problem, age, race, and socio-economic status of the patient, the provider's personal interest in the patient, and the patient's perception of the thoroughness of the examination. Most research on patient acceptance, however, is lacking in information on the personal characteristics of the health personnel whose effectiveness and acceptance are being evaluated. When generalizations are made on the basis of the acceptance of one or a few MHPs only, this is a particularly difficult problem. Nevertheless, given the overall high level of acceptance of MHPs, such factors lead more to variations among levels of satisfaction than outright negative attitudes toward MHPs.

III. 4. Issues of Physician Acceptance

A number of references [e.g., Andrews, Cohen et al, Golladay et al, and Kaiser Foundation, Refs. 7, 18, 36 and 43] cite the critical importance of physician acceptance in the successful integration of the MHP into health care systems. Since physicians effectively control the structure and manning of virtually all U.S. health care, it is imperative to understand the circumstances under which physicians will hire MHPs and to indicate factors that may make them reluctant to do so.

As Cohen et al [Ref. 18, pp. 52-53] indicate, physician acceptance data is often gathered as a by-product of research focused elsewhere, and

such data tend to be anecdotal. Yankauer et al [Ref. 87], for example, report that pediatrician attitudes toward NP's performance was "uniformly enthusiastic," but there is no elaboration on how this was determined.

Cohen et al [Ref. 18, pp. 46-56] summarize a number of prospective surveys showing general acceptance of the need for tasks to be delegated to MHPs, but a general reluctance to actually delegate these tasks. Fottler et al [Ref. 32] suggest a number of possible reasons, among them the uncertainty of outcomes derived from hiring MHPs, the threat posed by the MHP to existing configurations of roles and functions, risk to patient welfare, fear of legal liability, lack of understanding of the MHP concept, and conflict of the "team" concept with personal biases and values. Many of these factors operate differently in institutional and in fee-for-service settings. In some institutional settings, particularly in the armed forces, acceptance of MHPs on the part of physicians seems to be excellent. Bair and Stuart [Ref. 11] found that 91.5% of Army physicians surveyed felt there is a need for PAs. Over 92% indicated that they would use a PA with general skills if their service were understaffed with physicians, while over 81% would use the PA even if they were fully staffed with physicians. Nearly half (47.1%) of the physicians said they would actually request a PA even if their service were fully staffed with physicians. McDougall [Ref. 54, pp.49-51] cites an Air Force training evaluation indicating that 93% of the PAs graduating from the first Air Force class were rated "Excellent" or "Very Satisfactory" by their supervisor. The working relationship was rated "Outstanding" or "Very Satisfactory" by 95% of the physicians responding to the study. Page [Ref. 60, pp. 12-20] summarizes data indicating excellent acceptance of the PA in military settings, and indicates a number of additional areas for possible

PA utilization. Military settings are unusual, however, in that most military physicians are relatively young, have been serving involuntarily in many cases, and often lack a long range commitment to the system.

In institutions other than the military, physician acceptance of MHPs is less uniform. Garfield et al [Ref. 34] report that physicians in Kaiser-Permanente (Oakland, California) were equally divided in preference between an NP-staffed and a traditional system. The Kaiser Foundation [Ref. 43, p. 63], speaking of the Kaiser-Permanente (Portland, Oregon) practice, notes that "physician preferences (of the PA concept) may turn out to be the ultimate limiting force with respect to substitution (of the PAs for physicians)" pointing out that the nature of the physicians' tasks would change dramatically if large numbers of PAs were used.

In fee-for-service practices, the degree of MHP acceptance seems to be an individual matter. Turner et al [Ref. 80] report that 50 to 60% of physicians view their group's acceptance of NPs as high, while "bureaucratic inflexibilities" were cited as a common obstacle to effective use of the NP. Breer et al [Ref. 13] report relatively little conflict, on the whole, between MEDEX graduates and their physicians, but find a wide variation in the utilization and autonomy of the MEDEX. Some instances were cited where opposition to the PA concept on the part of local hospitals severely limited the work of the PA.

III. 5. Role Definitions for MHPs

Physician acceptance of MHPs is strongly related to the question of role definition, as a physician may accept the MHP concept readily for, say restricted roles but not unrestricted roles. A second question involves

the differences between NPs and PAs. If they are different resources how do they differ and how should tasks be allocated between them? Finally, an understanding of the role MHPs are to play would greatly facilitate the proper design of training programs, and would allow medical enabling legislation to set meaningful boundaries on allowable practices.

The formal definitions of NPs and PAs given in sections I and II of this chapter are too broad to be of much help in defining specific roles. The American Medical Association definition of a physician assistant indicates only that a PA

- is skilled,
- provides patient service, and
- works under the direct supervision of a physician.

The Congress of Nursing Practice definition of a nurse practitioner differs from the PA definition in that an NP

- is a licensed professional nurse, and
- engages in independent decision making, working with, rather than under, the physician.

The NPs as a group seem to feel that these differences are significant. Record and Greenlick [Ref. 66], for example, report that two nurse midwives refused to register under a state's PA law, presumably because they were already licensed as "independent" professionals under the state's Nurse Practice Act and did not wish to be viewed as PAs, an occupation seen as "dependent" by the nursing profession. In 1970 the American Medical Association attempted to set up a training program to make nurses into PAs, and met with a strong negative reaction from the American Nursing Association and the National League of Nursing [Ref. 72, pp. 7-71]. In general,

the nursing profession has continued to reject the idea of nurses becoming PAs, presumably due in part to perceived role differences between nurses and PAs. In addition, nurse associations have specifically rejected the idea of NPs taking the standardized certifying examination for PAs administered by the National Board of Medical Examiners. In the December 1973 administration, an estimated 10% of eligible NPs sat for the test, but this was directly opposed to the advice of the American Nursing Association, who in November 1973 took the position

> "...the certification process for physicians assistants is not designed for nurses and...nurses will not be encouraged, invited or coerced into participation in the certification process, including sitting for taking the examination. It is recognized that some nurses might select the route of a certified physicians assistant, however, the implications for scope and practice as it relates to the states' medical and nurse practice acts remains to be tested, perhaps in the courts." [Quoted in the Report of the Comptroller General, Ref. 19, p. 19.]

The American Nurses Association Board of Directors has also said that "the term 'physician's assistant' should not be applied to any of the nurse practitioners being prepared to function in an extension of the nursing role," that nurses are responsible for their own practice and accountable to their clients and their clients' families for maintaining standards of practice, and that if a nurse decides to become a physician assistant, he or she

- will not be licensed as an individual;
- cannot determine the scope of the practice, which may well be limited to physical diagnosis and assessment; and
- will not be responsible to the patient, but to the employing physician for the care given. [Comptroller General, Ref. 19, p. 19.]

Despite these differences in philosophy, it is unclear whether NPs and PAs in fact do different tasks in the field. The Comptroller General

[Ref 19, p. 5] quotes officials of the Dept. of Health, Education and Welfare saying flatly that graduates of PA and NP programs perform basically the same functions. This seems to be confirmed by the observation made later (pp. 11-12) that "graduates of all types of (MHP) programs were fulfilling the same basic role and (training) program officials were unable to provide...any specific examples of how graduates from various programs differed with regard to the functions they could perform." Many PAs in actual practice seem to be, or be capable of, practicing with a high degree of autonomy and independence [cf., Breer et al, Ref. 13, pp. 86-94, and Kaiser Foundation, Ref. 43], undermining arguments that NPs and PAs differ with regard to autonomy, at least to some extent. A number of references [e.g., Refs. 11, 20, 24, 43, 53, 65, 70, 80 and 82] provide fairly specific lists of medical tasks that PAs and NPs perform or are trained to perform, but there seems to be no systematic differentiation on the basis of these tasks. Direct comparison is difficult, however, due to the differing methodologies used in the various studies.

In summary, there seems to be agreement that both NPs and PAs fill a role lying somewhere below the physician and above the nurse in general skill. Beyond that, the particular role fulfilled by any MHP seems to be a function of his personality and skills and the willingness of his physician supervisor, the employing medical institution, and the outside medical community to allow him to practice. The practice options are constrained, of course, by legal restrictions in many states. Despite the rather strong feelings of professional associations, particularly on the part of the nurses, there have been no clearly demonstrated differences between the roles of PAs and NPs in the field.

III. 6. Training and Background for MHPs

The diversity of roles for MHPs is reflected in the diversity of programs available for the initial education of MHPs (continuing in-service educational opportunities for MHPs, which are not generally available, are not discussed here). The Comptroller General [Ref. 19] reviewed 19 training programs and found that

> "The training methods and concepts used by the different programs varied greatly. Some programs emphasized training for the performance of specific tasks; others emphasized a broader understanding of theoretical and scientific medical concepts. The length of the training provided in the programs we reviewed ranged from 4 months to 4 years. Backgrounds of the students admitted into the different programs also varied considerably--from students with no medical training or experience to registered nurses and ex-military corpsmen with years of training and experience. Many of these variations were the result of the innovative nature of the physician extender concept and the conceptual and philosophical differences underlying the programs."

Some aspects of the programs studied in Ref. 3 are summarized in Table 2.1.

The PA programs are somewhat more unified than those for the NP. The National Academy of Sciences' Institute of Medicine has defined three levels of PAs, a certification examination for PAs administered by the National Board of Medical Examiners gives independent verification of PA competence, and two national organizations serving PA interests (the American Academy of Physician's Assistants and Association of Physician Assistant Programs) have been founded. PA programs can be roughly divided into MEDEX-type, with primarily preceptorship training, and PA-type, with primarily academic training. Cohen et al [Ref. 18, pp. 22-23] differentiate these orientations as follows:

"The objective of the MEDEX program is to train and deploy the enrollee. Thus the central focus is on practice, not theory. Although the MEDEX trainee receives from three to five months university-based training, which also includes clinical experience, the bulk of the training occurs during the preceptorship, in which the student works with a general practitioner in learning the day to day activities of primary care. Thus, the emphasis on the preceptorship part of the training insures that the student's orientation will be to primary care rather than to specialty care often fostered in the university setting.

Unlike MEDEX training, the physician's assistant training is located at the university. The PA trainee receives nine months of didactic instruction in basic preclinical sciences with eighteen months of clinical rotations. Thus the training is academically specialty-oriented, with the result that the majority of graduates may choose to remain in the university medical center, rather than to work in a primary care practice."

The NP programs, in contrast, defy any effort to unite and summarize them under one heading. As seen from Table 2.3, NP programs vary widely in length and emphasis. Common elements to all NP programs are:

incorporation of theory and practice into developmental and physical assessment skills, interpretation of laboratory findings, fundamentals of history-taking, selected aspects of clinical medicine, including diagnosis and treatment, and assessment of community resources and needs. The typical nurse practitioner training program is four-six months long, is divided between didactic and clinical instruction, and trains its students to perform a variety of tasks including giving physical exams, ordering tests and medications under standing orders, instructing, monitoring, and counselling patients, and managing diseases. [Cohen et al, Ref. 18, pp. 23-24.]

Finally, the concept of team training is critical to the growth of the MHP concept. Traditional health occupations differ in their role expectations with respect to MHPs, and an understanding of factors influencing the effectiveness of health care teams could be important in resolving those conflicts. There is, however, little data on the relationship between team training and productivity. Most studies which examine this issue present only subjective evaluations [Cohen et al, Ref. 18, p. 25]. Quantitative data are badly needed before the usefulness of such training can be discussed.

III. 7. Legal Status of MHPs

MHPs working in civilian practices fall under medical practice legislation in each state. Thus the provisions of such legislation are critical if efficient and effective usage of MHPs is to be achieved. Broadly speaking, NPs practice under nursing practice acts, while there are two types of enabling legislation for PAs. These are: (1) the general delegatory statute that amends existing medical practice acts in order to allow PAs to work under the supervision of physicians, and (2) the regulatory authority statute which authorizes an organization (generally the State Board of Medical Examiners) to establish rules and regulations concerning PA educational and employment qualifications. By June 1975, 30 states had enacted regulatory legislation and 7 states had enacted delegatory authority legislation [Comptroller General, Ref. 19, p. 13, and Cohen et al, Ref. 18, p. 34].

As discussed in Cohen et al [Ref. 18, pp. 33-40 and Appendix C], legislation is usually vague, leaving a number of questions regarding practice unanswered. Nursing legislation, for example, generally prohibits nurses from performing acts of diagnosis and prescription; few states have amended these acts to allow for a greater role by NPs. The PA enabling legislation leaves a number of problems unsolved: the scope of delegable functions, the nature of requisite physician supervision (over-the-shoulder, next room, access by telephone, limits on physician/PA ratios), the appropriate standard of care, liability for malpractice suits, and enforcement procedures, to cite a few.

There is no doubt that legal restrictions limit the use of MHPs in practice. Dean [Ref. 23, cited in McDougall, Ref. 54, p. 44] states, for example, that professional associations of optometry, dentistry, and pharmacy have

successfully lobbied for laws barring PAs from performing functions related to these areas in ten, six, and five states, respectively. Levy et al [Ref. 49, cited in Cohen et al, Ref. 18, pp. 35-36] describes an experimental program in which nurse midwives were permitted to provide complete maternity care. Substantial improvements in infant health outcome and other indices were noted, yet the program was discontinued since the State Medical Association refused to support a permanent change in the state laws which would have allowed the nurse midwives to practice as they had during the program. The cost study of PAs discussed by Kaiser Foundation [Ref. 43] was constrained by legal restrictions on the physician/PA ratio in the two states involved. Both states (Washington and Oregon) required a 1:1 physician to PA ratio, yet the least-cost combination of resources would call for far more PAs than physicians in ambulatory primary care clinics. This reduces the estimated potential savings in the clinic from over $325,000 to under $135,000 [Kaiser Foundation, Ref. 43, pp. 46-47]. The authors also note that "it is interesting that the legal constraint which frustrates savings is expressed in the one-to-one supervisory ratio rather than in the definition of PA-appropriate services. It is also worth noting that within the same department--five primary-care nurse practitioners, functioning under nursing rather than under medical statutes and boards, are operating a health-appraisal clinic with a single internist as supervisor," [Ref. 43, p. 63]. Finally, strict regulations developed by the California board have removed the incentive to employ PAs in that state. Among other provisions, the California regulations require written patient consent before a PA can perform non-emergency medical services, the PA must practice in close physical proximity to the supervising physician, the physician must

consult with the PA and the patient after the completion of a history taking and physical exam, and he must also consult both before and after the PA performs various routine laboratory and screening techniques and therapeutic procedures [Comptroller General, Ref. 19, p. 14].

In military settings the directives of the surgeons general for each service, rather than state legislation, determine the limits of MHP practice. Page [Ref. 60, pp. 9-12] summarizes the major provisions made for PA practice by each surgeon general. All authorize limited duties for PAs and all provide for general supervision by physicians. The proximity vision is left somewhat unclear, however. In the Army, PAs are designated as battalion medical officers, a position which insures remoteness from the supervising physician. Navy and Air Force directors provide for direct supervision, on a one-to-one basis in the case of the Air Force.

Finally, one should note the trends toward national PA certification and accreditation of PA training programs. The American Medical Association and the National Board of Medical Examiners have collaborated on developing a PA certification examination, which was first administered in December 1974 to 880 candidates. In April 1976, the Executive Director of the National Commission on Certification of Physicians' Assistants (NCCPA) reported that 2,800 PAs have been accredited since the first examination, a figure representing about 90 percent of all PA program graduates. The NCCPA itself was formed in 1974 in response to the need for a national accrediting process, and over 20 states (projected to be 25 states by July 1976) require NCCPA certification as a prerequisite to employment of primary care PAs [Ryser, Ref. 71].

These efforts have been supplemented by an American Medical Association

Joint Committee on PA educational programs, formed in 1972. As of 1974 there were 43 accredited training programs, with several additional programs in varying stages of the review process. Program accreditation is voluntary, and applies only to institutions, not individuals trained through those programs [Association of Physician's Assistant Programs, Ref. 8, p. 19]. As discussed above, the NPs have not chosen to become accredited through this means but are relying on nursing certification and practice acts.

III. 8. Political Problems of MHP Programs

Training programs, in particular for PAs, are subject to various political pressures. As stated by Ryser [Ref. 71] "the PA movement is largely a creation of the federal government, supported in large part by appropriations authorized in the 1971 comprehensive Health Manpower Act and subsequent continuing resolutions, and most of the programs...are still largely or wholly dependent on federal contracts for survival, (thus) the PA movement is particularly susceptible to changes in congressional mood." Sources for possible congressional mood changes are myriad, including pressure from medical and nursing associations and need for economies in federal programs. Congressional control is exerted not only through direct funding, but through Medicare reimbursement policies as well. This issue, which affects all MHPs, arises from the fact that Medicare Part B does not provide for reimbursement for MHP services in private physician-office settings. Under Part A of Medicare, however, institutions may be reimbursed for services of any salaried employee, including MHPs [Comptroller General, Ref. 19, p. 35]. This distinction limits the incentives to employ MHPs in private settings, contradicting in part one of the legislative goals of MHP programs, namely to alleviate

problems caused by the geographical maldistribution of physicians. The Comptroller General's Report to Congress [Ref. 19, pp. 24-32] states that unless the training program has a built-in deployment system to place graduates in underserved areas, graduates tend to (migrate) to areas where supplies of health manpower are greatest. In general, the aim of Congress in funding MHP programs is to improve the health care delivery system and the distribution, supply, quality, use and efficiency of health personnel. If these aims are not met (e.g., if geographic maldistribution is not alleviated) the MHP programs run a real danger of being terminated.

In the military the future status of MHP programs is uncertain. As of the summer of 1976 none of the services were accepting new inputs into in-house PA programs, but at least some NP programs were continuing. A memo by W. P. Clements, Principle Deputy Secretary of Defense, expressed belief in the viability of the PA concept, but articulated concern over the eventual role and procurement of PAs [Ref. 17].

III. 9. Military MHPs

In the preceding sections we have discussed the military health care setting separately from the civilian settings, and have pointed out the degree to which various concerns apply in the military. There are two additional areas which are peculiar to the military which should be discussed; the question of appropriate military rank for MHPs and the associated area of providing appropriate career patterns.

NPs in the military are nurses by background and training, hence have commissioned officer rank. Career paths for NPs are somewhat ambiguous, however, as NPs fall somewhere in between the nurse corps and the medical

corps in medical capability and job performance. Traditionally nurses have been promoted into nursing administration and away from patient care. The NP option allows a nurse to stay involved with patient care somewhat longer, but it is unclear where an NP career will eventually lead. Can an NP continue to be promoted while remaining strictly in patient care? If not, is he likely to be accepted into either the nursing or the medical corps administration?

For the PA, the question of rank is much more critical. Currently, PAs in the military are either warrant officers or high-grade enlisted [Page, Ref. 60]; there is some opinion that these ranks are not appropriate. McDougall [Ref. 54] surveyed military physicians, nurses, and PAs, asking them to rank the appropriateness of each of the following grades for PAs: a) commissioned officers; b) warrant officer; c) top three enlisted grades; d) top two enlisted grades; and e) top enlisted grade. Both the physicians and the PAs ranked "commissioned officer" as most appropriate and "warrant officer" as second choice, while the last three possibilities were strongly disfavored. Nurses ranked "warrant officer" first and "top enlisted grade" second, with "commissioned officer" being ranked last. Bair and Stuart [Ref. 11] reported that 67.6% of those Army physicians responding to their survey felt that PAs should be warrant officers, while 16.0% felt they should be commissioned, and 2.1% said either warrant or commissioned. Only 9.1% felt that PAs should have enlisted rank. It should be pointed out that the relative status of the PA relative to the NP in the military is probably a reversal of status (as measured by salary, not necessarily by duties or legal rights) in the civilian community. Career paths for PAs within the military are in one sense less important for PAs than for NPs, partly because the

services have recruited fairly senior enlisted men for training, leaving these personnel with a relatively short time between the completion of obligated service and the 20-year retirement point, and partly because enlisted or warrant status limits upward movement, hence expectations. Page [Ref. 60, pp.47-48] reports strong job-oriented preferences, however, for such options as horizontal and vertical mobility into various primary care areas or into specialties.

IV. The AMOSIST/NAMIC

The Automated Military Outpatient System (AMOS) project was initiated in December 1969 as a pilot system. The main idea of the project was to test the feasibility of having relatively low-level physician extenders (corpsmen) deliver primary medical care with the aid of well-defined algorithms under physician supervision. In October 1973 the program was officially adopted, and Army-wide training began at Ft. Belvoir, VA. In July 1974 the program was moved to the Academy of Health Sciences, Ft. Sam Houston, Texas [System Sciences, Inc., Ref. 78], p. III-1]. The Navy has also initiated a somewhat modified version of the AMOSIST program (the NAMIC program) but on a much more limited scale.

The AMOSIST training program consists of a twelve-week course divided into: (1) a two-week didactic phase, which introduces the student to the AMIC system, selected medical terminology, and medical skills; (2) a three-week applications phase in which the student is introduced to and uses the treatment algorithms used by the AMIC system; and (3) a seven-week application phase in which the student works under close supervision in the organization to which he is assigned. Brooke Army Medical Center [Ref. 14] cites

a similar pattern for AMOSIST training, although some details are changed.

Algorithms included in the AMIC system emphasize primary care to ambulatory patients with minor illnesses in the following areas:

- conjunctivitis - eye irritations,
- eyelid,
- upper respiratory infection/otitis,
- back or neck pain,
- extremity pain,
- dermatology,
- urinary tract infection,
- viral gastroenteritis, and
- breast.

The algorithms are designed to guide the AMOSIST through a straightforward diagnostic and treatment procedure. They typically include a number of tests for potentially serious conditions, and if there is any chance of the patient having a serious illness the algorithm provides for physician involvement. The AMIC system in any case provides for physician supervision of the AMOSISTs as well as periodic auditing of patient records generated by AMOSISTs.

There is relatively little systematic research as yet, on the cost-effectiveness or quality of care of the AMIC system. The System Sciences report [Ref. 78] summarizes two studies on the AMIC system, but these focused on learning rates of AMOSISTs and control methods, rather than on comparing AMOSIST-staffed with conventional systems. Bustos [Ref. 15] describes the AMIC system as "the greatest single contribution (to) ambulatory patient care to have crystallized over the past few years," and

discusses a number of quality control measures instituted by the AMIC program at Silas B. Hays Army Hospital at Fort Ord, Calif. Wolcott [Ref. 86] argues that AMOSIST-delivered care at Brooke Army Medical Center, Ft. Sam Houston, Texas, is

- legally and morally defensible, since proper use of the algorithms assures patient outcomes identical to those delivered by physicians,
- cost-effective, since care acceptable to both patients and staff can be delivered with lower cost and non-scarce personnel resources,
- and amenable to quality control.

Wolcott compared an AMIC clinic at Brooke Army Medical Center to a conventional clinic, and found that the AMIC clinic had roughly the same success in treating selected illnesses as the conventional clinic. He concludes that the AMIC clinic is less expensive, utilizes less physician time, and produces "unusually high rates of both patient satisfaction and acceptable patient outcome."

Some civilian programs which are roughly comparable to the AMIC system, in that relatively unskilled personnel utilize algorithms to deliver primary care, do exist. System Sciences, Inc. [Ref. 78] describes three programs in addition to the AMIC system, namely the Ambulatory Care Project of the Massachusetts Institute of Technology and Beth Israel Hospital of Boston, the Dartmouth-Promis Laboratory/MEDEX-New England Program, and the San Francisco Veterans Administration Hospital program. The Ambulatory Care Project trains unskilled persons, often with only a high school diploma, in a variety of algorithms, with satisfactory results. The Dartmouth/MEDEX programs evaluate the effectiveness of having MEDEX-trained personnel use algorithms, which were then evaluated by computer. The staffs of these programs

concluded that "the clinical algorithm system has proven to be of considerable value...Virtually all of the MEDEX-New England graduates and preceptors felt that there was sufficient justification for continued use of the system." [Darthmouth-PROMIS report, Ref. 22, cited by System Sciences, Inc., Ref. 78, p. V-19.] The San Francisco Veterans Administration Hospital health technician program also concentrated on training high school graduates in using algorithms, but these algorithms were limited to data collection only, rather than data collection plus treatment. The system is no longer in operation. Charles & Stimsen [Ref. 16, cited by System Sciences, Inc., Ref. 78, p. VI-4] state that "the program succeeded in meeting its stated goals, i.e., high school graduates could be taught to perform reliably a series of medical tasks..., the physical conditions under which patients wait are being improved (and) the medical records handling process has been improved." Further discussion of each of these projects, as well as a bibliography on these and related topics are contained in the System Sciences report [Ref. 78].

V. Summary

In this chapter three non-traditional health care roles, the nurse practitioner (NP), the physician assistant (PA), and the AMOSIST, are described. With any such system one must first establish whether or not the innovation is economically beneficial and whether or not adequate quality of care can be maintained. For both the NP and PA roles the literature strongly suggests that there are indeed definite cost incentives and few, if any, quality programs. Further, both innovations seem to be acceptable to patients. The major problems in utilizing these roles more fully lie in physician acceptance, role definition, determination of appropriate training and background,

legal status, political pressures, and special problems in the military, such as rank and career patterns. Thus the major focus on work to improve effectiveness must be on integrating the new roles into the existing medical system more fully, rather than on re-establishing the existence of cost and quality benefits. A summary of some concepts in organizational integration and personal behavior in organizations is given in the next chapter.

Chapter 3. Summary of Relevant Behavioral and Organizational Theory

I. Introduction

In Chapter 2 some of the problems underlying the effective utilization of para-professionals were introduced. Part of the problem, it was pointed out, lay in the inability to organize and manage these human resources adequately. This chapter acquaints the reader with some of the organizational effectiveness literature and concepts which are relevant to the research.

II. Work-Related Attitudes

The idea that attitudes affect behavior is of central interest, and one section of the research questionnaire is designed to discern some of the motives behind certain actions. If a better understanding of the perceptions and attitudes held by para-professional personnel can be achieved, then it might help in predicting outcomes. It is important, for example, to find out if there is a willingness to work in an atmosphere conducive to working in collaboration with others. Also, it is important to know the extent of their need for autonomy and to assess how compatible it is with task demands.

Much has been written about the attitudes and behaviors of professionals. Studies have shown that professionals value independence in their work, often to fulfill the personal needs which drove them to the profession in the first place [Parsons, Ref. 61]. The essence of valuing independence is in order to protect integrity, to apply specialized knowledge about which most administrators are judged incompetent to control, and to join other colleagues in professional societies that become as important as the organization for which one works [Scott, Ref. 76].

Those who have studied para-professionals, however, feel that they too adopt these values of autonomy without necessarily possessing the same ethics and demands for safeguarding specialized knowledge. In fact, Scott [Ref. 75] has defined the two groups as follows:

> A professional is "a person who by virtue of long training is qualified to perform specialized activities autonomously, relatively free from external supervision or regulation."
>
> Whereas, a para-professional is "a person performing specialized but more routine activities under the supervision of officials organized in a hierarchical function" (p. 82).

Many would consider the following "professionals" to fall into this para-professional category: school teachers, social workers, nurses [Etzioni, Ref. 29]. There is some question about whether physician assistants and nurse practitioners are para-professionals or fall somewhere between para- and full-professional status. In many states, for example, NPs can establish their own private practice. The key distinction between these two functions is that the professional is "qualified to perform specialized activities autonomously" while the para-professional performs "specialized but more routine activites under the supervision of officials..." Also related is the question of where those roles perceive themselves to be located and/or desire the organization to see them located on the para-professional continuum. Discrepancies between these two sets of perceptions can affect motivation and morale in the system [Likert, Ref. 51, Hackman and Lawler, Ref. 38].

Another attitude-based issue of concern is the extent to which these roles are comfortable with and desire collaborative or team-approach work environment. There is a growing literature on the advantages of, and ways of organizing team-approaches to health care delivery [Wise et al, Ref. 85].

Rubin and Beckhard [Ref. 69] tell us that effective health teams should exhibit goal-oriented behavior, should agree to a clear expectation about how each member will function in his roles, should be able to effectively problem-solve and make group decisions and should be able to freely and openly communicate. If team delivery is desirable, it is important to understand the relationship between attitudes towards co-workers and collaboration and task performance [Likert, Ref. 51].

III. Organizational Structure

The organizational literature argues that professionals seem to work best in more loosely controlled or loosely supervised situations where it is appropriate to let them supply their specialized knowledge according to their best judgment [Aiken and Hage, Ref. 2, p. 166]. Non-professionals, especially those performing routine tasks, can be more tightly organized and supervised [Perrow, Ref. 64, and Lortie, Ref. 52]. Although there is relative agreement on these statements, the issue of appropriate structural configuration and degree of control is still problematic [Merton, Ref. 56, Katz and Kahn, Ref. 44, Lawrence and Lorsch, Ref. 47]. The question arises as to how much and what kind of organizational control is desirable for para-professionals. One way to determine the answer to this question is to examine whether the organizational structure is tightly or loosely controlled [Lawrence and Lorsch, Ref. 47, Rosengren, Ref. 67, and Aiken and Hage, Ref. 4] This is also a function of how extensive and explicit are the rules and procedures [Gouldner, Ref. 37, Hage, Ref. 39]. Finally, it is important to determine the nature of the work being controlled. To what extent are medical decisions controlled versus administrative decisions? What are the

implications for various patterns of control for the different groups of personnel on morale and other work-related attitudes?

IV. Distribution of Influence

In any study of organizational effectiveness it is important to ascertain who in the enterprise is perceived by others to have influence. This is not necessarily analogous with who has authority, as significant influence can be derived informally (e.g., by amassing expertise or by being a charismatic representative of a group without a specific organizational role).

The research had a goal of determining perceived power and influence of varied roles in a medical setting. Traditionally, it has been the physician possessing the vast majority of power but more recently, with the advent of team medical practice and para-medics, this has been changing [Pellegrino, Ref. 63].

Moreover, in some large and complex organizations either nobody feels powerful, or groups perceive that the power is elsewhere, but no one role group seems to claim it. This is important since a feeling of powerlessness could be indicative of an unhealthy organizational condition wherein all parties seem to be suffering and no group is effectively managing.

Because the subjects being researched in this study operated in a rank-oriented military hierarchy as well as a medical setting, we wanted to determine the correlation between distribution of informal and formal (rank) influence.

We were also interested in the way the new para-medics were perceived on their ability to establish themselves as a powerful group in the various government bureaus which affect them. If not, is this a problem and how?

If so, what methods did they employ to gain acceptance [Korda, Ref. 46, and French and Raven, Ref. 33]?

Finally, which groups, especially among the para-professionals, see themselves as more influential than others see them? Such an indicator can help us to determine the extent to which the group's expectations were inflated and unrealistic. A long-run consequence of inflated self-perceptions can be dissatisfaction [Derr, Ref. 25].

V. Job Satisfaction

Other than those issues already raised in the section on "Work-Related Attitudes" above, we were also concerned about how attitudes about the nature of the work impacted on the motivation to work and on performance.

One theory about motivation thought to be relevant for this study is the Herzberg [Ref. 41] ideas about hygiene and motivating factors. He maintains that some factors, such as working conditions, salary, relationships with the supervisor, company policies and benefits, and the job environment or physical conditions are important, not so much because they motivate employees to perform but, rather because their absence causes dissatisfaction and inhibits good performance. In other words, these hygiene factors are basic commodities without which motivational interventions have no chance. They are not, however, motivating factors.

The satisfiers or motivators are such items as recognition for good work, interesting work itself, responsibility, achievement or meeting a goal, and advancement commensurate with performance. Once the hygiene factors are satisfied, these motivators can be manipulated to attain higher degrees of job satisfaction and performance. As to the critical attitudes about self

which impact on performance; Brayfield and Crockett [Ref. 12] have addressed the relationship between satisfaction and productivity. They suggest that while little direct relationship exists, job satisfaction may affect the quality of the worker, the quality of job performance and the harmony of labor-management relations.

We also suspect that the military is unique, by comparison to other large organizations, concerning its provision for early retirement (after twenty years) with very attractive retirement benefits. In this study, we examine the relationship between attitudes, satisfaction and the intention to stay in the military. We also examine certain demographic characteristics such as age, sex and, especially, number of years service, with the intention to re-enlist. It may be that the retirement benefits are so attractive that the role occupant is quite willing to be dissatisfied yet remain for the twenty-year period. It may be that a critical retention factor is the number of years prior service, for at some point the person plans to remain for twenty years regardless of attitude and job satisfaction.

VI. Careers

Schein's work, [Ref. 73] on "career anchors" (i.e., basic values, motives, needs and talents which keep a person pursuing certain kinds of careers) among M.I.T. MBA's pursuing a career, demonstrates the importance of ascertaining primary work values. If a person is managerially-oriented, for example, and is placed in a job calling for little interaction and use of authority, he might be dissatisfied and leave. To learn the career anchors of a para-medical professional would eventually help to establish a method for testing persons in order to match their needs with their future jobs.

Moreover, finding a predominance of these anchors in various persons and role groups could help to adapt and enrich the quality of work life and to design jobs appropriate to satisfaction and retention. Derr's exploratory research among officers at the Naval Postgraduate School, for example, indicates that the surface community is most managerially-oriented, while aviators are more "technical-functional" and CEC officers more security-minded [Ref. 25].

Bailyn [Ref. 10] has researched persons who accommodate to their careers by either choosing an outside-the-organization orientation or a work orientation. While many persons may seek for balance between their professional and personal lives, there is evidence to suggest that changing social values are shifting away from the career as the primary activity, and that the key to attracting the best people in the future is to offer them more flexible career paths that encompass their total life space (including opportunities to have a meaningful personal life).

The work of Dalton and Thompson [Ref. 21] among engineers and scientists relates progression through certain career stages to performance. Wilcove's recent study at NPRDC [Ref. 84] identifies six career stages for a Naval officer and may be helpful in understanding the transition points.

VII. Focal Research Issues

Since the utilization of paramedics in military settings has numerous considerations, the primary thrust of the present research has been to explore current utilization practices. By surveying the relatively new territory of military paramedics, we hoped to identify opportunities for improving the quality and efficiency of health care delivery as well as

problems in managing additional medical roles. As utilization issues are examined and clarified, it is hoped that a variety of strategies may be discovered in support of more effective military health care.

Among the important issues addressed in this study is the degree of functional differentiation among the various roles of medical providers. In other words, we were interested in the differences among physician assistants, nurse practitioners, AMOCISTs and physicians with respect to the medical tasks they perform. The institutional distinctions among the various providers may or may not be supported by any real differences in function served. If functional differences do exist, it is a matter of some interest to discover the specific dimensions along which the roles are differentiated. Such knowledge would address the extent to which paramedics and physicians are complementary, supplementary, redundant, or substitutable in terms of services offered.

A second set of issues concerns the organizational problems associated with the use of physician assistants and nurse practitioners. Such issues include the kind and severity of role conflict, the quality of communication and coordination, the impact of organizational structure, and the importance of institutional rewards (e.g., pay, rank and educational opportunities). In addition, this study explored differences among the three uniformed services in terms of utilization patterns, career preferences and job satisfaction of various medical practitioners, and rank/status policies.

A third focal point was the evaluation of the functional utilization of PAs and NPs. Comparisons were made on fifty various medical tasks in terms of task complexity as rated by physicians, expected competency as rated by trainers of PAs and NPs, and frequency of performance as reported

by the different paramedic roles.

Finally PA_S and NP_S were compared in terms of rank, length of service, sex and age to determine differences in personal characteristics if any

Chapter 4. METHODOLOGY

I. Overview of the Approach

Two means of gathering data were used in the study, field interviews and self-administered, mail-return questionnaires. The interviews were used to familiarize the research group with the settings in which paramedical personnel were used, to explore a number of potential problem areas in paramedical personnel usage, and to probe into problem areas in depth. The questionnaire, which was designed and tested during the field work, was then used as the primary means of gathering data from a broad spectrum of military health care settings. Virtually all major armed forces health care facilities in the continental United States were included in the survey. These data, supplemented by our field observations, then formed the basis of our analysis and conclusions. These two data gathering methods are discussed in greater depth in the remainder of this chapter.

II. Field Interviews

Forty-five persons, including AMOSISTs, NAMICs, nurses, nurse supervisors, nurse clinicians and practitioners, physician assistants, physicians involved in supervising the above personnel, and persons involved in training paramedics, were interviewed. We visited three field sites: the Naval Regional Medical Center at San Diego, Calif.; Brooke Army Medical Center at Ft. Sam Houston, Tex; and the Ambulatory Care Clinic at Travis Air Force Base, Calif. The Naval Regional Medical Center is a very large facility, consisting of a central hospital and a number of outlying clinics; this allowed us to interview personnel in a variety of locations. San Diego is also one of the two naval facilities with a NAMIC program, allowing us to

interview NAMICs and their supervisors. Brooke is also a large facility, located in the same base as the major Army health training and research centers. During this visit we not only interveiwed paramedical personnel in an Army central facility, but were able to discuss AMOSIST and physician assistant training as well. The Travis Facility is considerably smaller, and enabled us to interview personnel in an Air Force ambulatory case setting.

The interviews generally lasted about 45 minutes. Most of the questions were open-ended, focusing on such areas as background and education and the appropriateness of same for the tasks being performed, career plans, autonomy and responsibility in the work setting, rewards, punishments, and evaluation criteria, effectiveness in delivering patient care and major barriers to increased effectiveness, and overall satisfaction or dissatisfaction with the role. Those interviewed were also asked to indicate how often they performed certain tasks, and also asked their opinion of what level of training is required to perform those tasks. Finally, a number of fixed-response questions were used to define various aspects of the work setting.

III Self-Administered Questionnaires

A. Administration of Questionnaires

Three related questionnaires were used in this study as summarized in Table 4.1. First, 4,000 self-administered, mail-return questionnaires (Q1) were sent to 94 Air Force locations, 29 Navy locations, and 37 Army locations. These represent virtually all major health care facilities in the continental United States. Packets of twenty-five questionnaires, along with an authorization from the appropriate Surgeon General, cover letters explaining the project, and return envelopes, were sent to the commanding officer of each facility, with instructions to distribute them among the various

Table 4.1. Summary of Questionnaire Administration

Type of Personnel	No. Surveyed	Content Areas Included
Questionnaire 1 (Q1) - Military Care Providers		
Physicians Nurses Nursing Supervisors Physician Assistants Nurse Practitioners NAMIC/AMOSIST Corpsmen	4,000 Questionnaires in 160 locations	Tasks performed in current job Setting in which they work Organizational Structure Attitudes about work environment Job satisfaction Perceptions about other providers Career aspirations Personal information
Questionnaire 2 (Q2) - Trainers of Military Physician-Extenders		
Persons involved in design, administration, and/or teaching of training programs for: Physician Assistants Nurse Practitioners NAMIC/AMOSIST Corpsmen	112 Questionnaires in 9 locations	Tasks their graduates <u>can</u> perform Setting in which they currently work Perceptions about other providers Personal information
Questionnaire 3 (Q3) - Physicians to evaluate "task difficulty"		
Military & Civilian Physicians	8 Questionnaires	Medical specialty Relative difficulty of list of medical tasks Personal information

categories of medical personnel of interest. A list of the medical roles being examined in this study was also included. Second, 112 questionnaires (Q2) were mailed to trainers of military paramedics in nine locations. These locations included all facilities training military physician assistants, the AMOSIST and one of the two NAMIC training facilities, a number of nurse practitioner training programs, and a corpsman training location. These questionnaires were distributed similarly to the first, with the head of the training program being asked to distribute the questionnaires among persons involved in the design, administration, and/or teaching of the program. The number of questionnaires in each packet varied from two to twenty-five. Finally, eight questionnaires (Q3) were sent to selected military and civilian physicians.

B. Interrelationship of Questionnaires

All three questionnaires serve a different purpose and represent different target populations, yet are very much interrelated. The primary linkage between the three questionnaires (Q1, Q2, Q3) involves the "medical tasks" lists, which are related to the "patterns of utilization" questions posed earlier. Each of the three questionnaires has an identical list of 50 medical tasks. Q1 asks field personnel what tasks they actually perform; Q2 asks 'trainers' which tasks their graduates can perform as a result of their training; and Q3 asks physicians ('experts') to rate the relative difficulty involved in performing each task. Appendices 4.1, 4.2 and 4.3 contain samples of the three questionnaires.

C. Design of the Questionnaires

The purpose of this section is to discuss the sources for the questions

appearing on each questionnaire, and to cite our reasons for including them. Throughout the section reference should be made to the sample questionnaires in appendices 4.1, 4.2 and 4.3 for Q1, Q2 and Q3 respectively.

The provider questionnaire, Q1, is divided into five parts. Part I elicits a rough description of the provider, where he is working and his patient load. This allows us to examine both work setting and patient load as they relate to job satisfaction and effectiveness, and to construct a profile of actual work settings for each role.

Part II is intended to sample medical tasks of a variety of difficulty levels, some from each area a physician extender or paramedic might be expected to specialize in, as well as some that are probably beyond the intended capability of most extenders.

Part III elicits perceptions of what the work setting is like, asking the respondent to describe the work setting along a number of dimensions. The specific questions tap various areas (e.g., communications, subordinate and peer relationships, etc.) that define the nature and quality of the work setting. Our literature survey and preliminary field work both indicated the importance of the functioning of the new practitioner in his setting, so we designed this area so as to be able to analyze those organizational conditions that seem to be related to appropriate utilization, as measured by the match of the tasks performed in Part II to the training and capacity of the role and by job satisfaction. Simply stated, we wished to relate the characteristics of the work setting to effectiveness. Section A of Part III explores work related attitudes and descriptions; Section B describes organizational structure; Section C elicits perceptions of how power and influence are distributed; Section D asks for the perceived value of each role; while

Section E explores specific components of job satisfaction. Questions in Section A were selected from the Navy Human Resource Management Survey [Ref. 42] which in turn was adapted from the Survey of Organizations developed by the Institute for Social Research, University of Michigan [Ref. 79]. Section B consists of selected questions from Hage, et al [Ref. 40], from a questionnaire developed to measure the degree of formalization of organizational structure. Section C was also adapted from the University of Michigan Survey of Organization [Ref. 79], Section D was specifically designed for this project, and Section E was adapted from the Navy Human Resource Management Survey [Ref. 42].

Part IV focuses on career-related questions. These were specifically designed for this research to test one's basic "career anchors" (basic values, motives, needs and talents which keep a person pursuing certain kinds of careers). The five primary anchors uncovered by Schein are: need for autonomy or independence at work, need for job security, need for technical-functional competence, need for managerial experience and need for exercising creativity on the job. These values tend to hold constant during much of the work life regardless of a particular switch in actual work assignments or places of employment. Finally, Part V elicits demographic data, use of which is self-evident.

The questionnaire for trainers (Q2) also has five parts. Part I goes into the role of the respondent, his training, his current role in training, and the professional or paraprofessional being trained. Part II contains the same job list as Q1, but now the trainer is asked to evaluate the competence of the graduates from his training program in each task. This allows us to compare the trainers evaluation of graduate competence, thus (indirectly

the design of the training program with the tasks the graduates actually perform in the field. Part III asks the trainers to evaluate the value of each type of medical care provider in ambulatory care. If members of certain roles misperceive their own value, part of the reason may be in expectations built up during training. This set of questions allows us to examine the degree to which misperceptions exist among trainers. Part IV goes into career-oriented issues, for the same reasons. Finally, Part V elicits demographic data.

The physician questionnaire (Q3) consists of three parts only. Part I asks for the respondent's medical background, while Part III focuses on demographic information. Part II contains the same medical task list as Q1 and Q2, and asks the physician to rate the difficulty of each task. This enables us to determine whether the tasks done by persons in each medical role differ systematically from role to role, and if so, which groups tend to perform the more difficult tasks.

Chapter 5

RESULTS

I. Introduction

Of the 4000 surveys sent out to various military bases in the Army, Navy and Air Force, 2591 were returned through the mail, a return rate of approximately 65%. An additional 267 questionnaires were returned without being completed due to questionaires arriving too late (mail delays), incorrect addresses, lack of enough potential respondents, or lack of experience of some bases with paramedical personnel. The sample distributions by sex, length of service and age are given in Table 5.1. Given the wealth of data collected and the large number of possibilities for analysis, only the most general results are presented in this report.

II. Effectiveness Measures

II. A. Current Usage Patterns

II. A. 1. Work Locations.

One obvious aspect of paramedic utilization is the distribution of physician assistants (PAs) and nurse practitioners (NPs) among various work locations. As Table 5.2 indicates, there is much similarity in assignment across the three branches of the military. While the majority of PAs are used in ambulatory settings in all three services, the remainder are distributed in a variety of locations. One notable difference is that the Army has no PAs assigned to family practice while the other services have 10% of their PAs so assigned.

The interservice differences are more numerous with respect to NP assignments. The Army distributes NPs across all clinics, that relatively few NPs are in family practice clinics. In contrast, the Navy concentrates about one-third of the NPs in ambulatory settings and about one-

Table 5.1
Characteristics of Sample by Medical Role

Characteristic	Medical Role[a]					
	MD	N	PA	NP	AMOSIST	HM
No. of respondents--total	590	438	248	324	120	713
--Army respondents	115	116	36	86	104	111
--Navy respondents	132	92	52	45	15	177
--Air Force respondents	316	195	158	168	1	418
--Other respondents	27	35	2	25	0	7
Percent involved in direct patient care	98.5%	61.4%	98.8%	97.8%	98.3%	77.0%
Percent male	96.9%	14.9%	98.0%	12.7%	67.5%	81.4%
Median age (years)	31.8	36.6	33.3	33.4	25.0	26.2
Median years of service	2.7	11.5	14.2	7.8	3.9	5.5
Percent professing career intention[b]	37.1%	77.7%	75.9%	75.0%	52.4%	55.0%

[a]Abbreviations:

MD-physician
N-nurse
PA-physician's assistant
NP-nurse practitioner, nurse clinician
AMOSIST-AMOSIST or NAMIC
HM-corpsman

[b]If years of service plus years intending to remain are 19 or over, the respondent is considered to be professing a career intention.

Table 5.2
Distribution of PAs and NPs Among Work Locations by Service

Physician Assistant Responses

Work Location	Army (36)*	Navy (51)*	Air Force (157)*
Ambulatory Setting	61.1%	54.9%	64.3%
Family Practice	0 %	9.8%	10.2%
Internal Medicine	2.8%	7.8%	0 %
Unspecified Clinics	25.0%	13.7%	9.6%
Miscellaneous	11.1%	13.8%	15.9%
Total	100%	100%	100%

Nurse Practitioner Responses

Work Location	Army (85)*	Navy (43)*	Air Force (168)*
Ambulatory Clinic	12.9%	32.6%	15.5%
Family Practice Clinic	5.9%	16.3%	2.4%
Internal Medicine Clinic	15.3%	4.7%	0.6%
OB-GYN Clinic	23.5%	18.6%	36.3%
Pediatric Clinic	18.8%	16.3%	30.4%
Unspecified Clinic	14.1%	2.3%	7.1%
Miscellaneous	9.5%	9.3%	7.8%
Total	100%	100%	100%

*Numbers in parentheses are the number of respondents in each category.

sixth each in family practice, OB-GYN and pediatrics. However, the Air Force has two-thirds of their NPs split between OB-GYN and pediatrics with about onesixth in ambulatory settings. In summary, the Army utilizes NPs in the widest variety of settings and the Air Force in the least variety.

Of the 104 AMOSISts responding from the Army, the overwhelming proportion (86.4%) work in ambulatory settings. Comparison with Navy NAMICs is tenuous because only 14 NAMICs responded, but of these 64.8% were in ambulatory clinics and 35.7% were in internal medicine clinics. The Air Force has no comparable program.

II. A. 2. Specialty Training.

Table 5.3 summarizes the specialty training of each role. Again, the differences between PAs and NPs are striking. Nearly all the PAs (98.4%) either have no specialty or specialize in family practices, but only 19.8% of the NPs could be so classified. Nearly two-thirds (66.4%) of the NPs specialized in OB-GYN, pediatrics, or chronic care. Physicians were distributed among most of the specialties, while AMOSISTs and corpsmen, as one would expect, generally had no specialty.

By and large, those who had specialty training ended up in their specialty area. We examined four specialty areas; OB-GYN, family practice, pediatrics, and internal medicine, and determined work locations for those two roles (physician and NP) which most heavily specialized in these areas. Results are summarized in Table 5.4. These data do not mean that specialty trained personnel rarely work outside their specialty; rather, they imply that in the majority of cases the primary work location reflects specialty training. If such personnel are routinely assigned duty outside their area, to emergency room duty for example, they may in fact spend a substantial portion of their time outside their specialty.

Table 5.3
Specialty Training by Role

Specialty	Role					
	MD	N	PA	NP	AMOSIST	HM
Psychiatry	1.9%	2.3%	0.4%	2.2%	0.0%	0.7%
Surgery	10.0	5.7	0.0	0.6	0.0	1.1
OB-GYN	11.9	5.9	0.0	28.1	0.0	0.6
Pediatrics	12.6	3.2	0.0	29.0	0.0	1.3
Chronic Illness	0.0	0.2	0.0	9.3	1.7	0.7
Internal Medicine	21.6	0.2	0.8	2.5	1.7	0.3
Family Practice	14.1	0.9	28.2	13.0	0.8	0.8
No Specialty	13.9	53.4	70.2	6.8	87.5	91.2
All Else	14.0	28.2	0.4	8.5	8.3	3.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 5.4
Work Locations for Specialty Trained Personnel

Specialty	Percentage of these with specialty training who give an appropriate specialty clinic as their primary work location	
	Physician	Nurse Practitioner
OB-GYN	80.0%	96.7%
Pediatrics	70.3	84.0
Internal Medicine	63.8	62.5
Family Practice	84.4	81.0

II. A. 3. Patient Workloads.

Average workloads for each role are summarized in Table 5.5. The physician assistants clearly see themselves as processing the highest number of patients per shift. Physicians were next highest, then nurse practitioners. The loads are fairly consistent among the services, except that Navy PAs report seeing fewer patients than either Army or Air Force PAs, while Air Force NPs see an exceptionally large number. These observations may be explained by their assignments. Army PAs serve as Battalion Medical Officers, thus see a large number of relatively minor problems. Air Force PAs and NPs both serve in relatively small medical units, while Navy PAs typically serve in larger installations. It is possible (but by no means is established) that the larger installations have less emphasis on processing large numbers of patients.

It should also be kept in mind that these data are self-reported, thus may be biased. The NPs for example, frequently expressed dissatisfaction with "numbers orientation" during our field interviews, and stated that patient loads were to heavy. They may have systematically biased their patient load estimates upward to state this point more strongly.

II. A. 4. Differences in Patients Served.

Examination of the kinds of patients served by PAs and NPs yielded several differences (Table 5.6). First, Army PAs spend most of their time with active duty patients and hardly any time with dependents and retired, consistent with their assignments in Battalions. Navy PAs spend approximately the same time on all three classes, while the Air Force spends somewhat more time with dependents. There are no strong inter-service differences regarding type of medical complaint. All PAs spend most of their time on accute illnesses and the least on routine check-ups.

Table 5.5
Average Patient Workloads

Medical Role Of Provider	Average No. (Standard Error) of Patients Per Shift			
	Army	Navy	Air Force	Overall
Physicians	25.920 (1.213)	23.017 (.874)	24.623 (.563)	24.749 (.439)
Nurses & Nurse Supervisors	21.444 (1.705)	20.171 (1.921)	17.327 (1.061)	19.184 (.786)
Physician Assistants	31.292 (2.001)	26.320 (1.358)	30.361 (.635)	29.584 (.566)
Nurse Practitioners	18.787 (1.079)	18.476 (1.108)	23.453 (.494)	21.275 (.446)
NAMICs/AMOSISTs	19.368 (.824)	17.143 (1.026)	---	19.000 (.730)
Corpsman	21.593 (1.705)	19.377 (1.005)	19.136 (.707)	19.546 (.547)

Table 5.6
Types of Patients Served by Physician Assistants

	Average Estimate of Amount of Time Spent (1 = All of the time, 5 = None of the time)		
Patient Type	Army (36)*	Navy (52)*	Air Force (157)*
Active Duty	1.75	3.17	3.34
Dependents	4.07	3.17	2.76
Retired	4.52	3.56	3.66
Patient Needs			
Acute Illness--Injury	2.22	2.54	2.46
Chronic Illness	3.92	3.73	3.58
Routine Check-ups	4.06	3.84	4.12

Types of Patients Served by Nurse Practitioners

Patient Type	Army (79)*	Navy (44)*	Air Force (162)*
Active Duty	4.03	4.51	3.89
Dependents	2.31	2.05	1.93
Retired	3.59	3.44	4.04
Patient Needs			
Acute Illness--Injury	3.52	3.05	3.16
Chronic Illness	3.27	3.29	4.05
Routine Check-ups	3.39	3.26	2.89

*(Sample Size)

With NPs there is also much homogeneity across services regarding both kinds of patients and types of complaints. NPs spend most time with dependents and approximately the same amount of time on the three general classes of complaints. One exception is that Air Force NPs spend substantially more time on routine check-ups than on chronic illnesses.

Roughly speaking, then, PAs seem to functionally specialize on acute care while NPs specialize on all types of care for dependents. These data allow us to define a de facto segregation of PA and NP roles roughly along the following lines:

-The PAs are rarely specialized and usually work in ambulatory settings. They see a very large patent load, implying either an emphasis on routine problems and rapid procedures or that they work long hours, or perhaps both. They emphasize acute care over chronic care or routine check-ups.

-The NPs are more diverse. They frequently specialize in dependent-related specialties, such as pediatrics or OB/GYN, or in chronic care. They average a patient load of just over 2 1/2 patients per hour; clearly less than PAs but still a heavy load. They emphasize dependent-related care over active duty or retired care, probably as a function of their specializations and practice settings.

-AMOSISTs and NAMICs work in ambulatory settings and see an average of 19 patients per day.

II. B. Medical Tasks Performed

In order to determine the degree of functional differentiation between physician assistants, nurse practitioners and other more traditional provider roles, an analysis was performed on the frequency

with which assorted medical tasks are performed. A list of fifty specific tasks was provided, covering a wide range of difficulty, medical specialization, and type of care, and each respondent was asked to estimate how frequently he performed each task. Each of the fifty tasks was then assigned a complexity rating, as evaluated by a sample of eight physicians, and finally, 112 trainers of paramedical personnel were asked to evaluate each task in terms of how competent the graduates of their particular training program were in performing the tasks. Results for all the tasks are provided in Appendix 5.1.

Comparison of the frequency of performance and the complexity of each medical task yielded no significant correlation for phsicians, PAs, or NPs. In other words, for these three provider roles the complexity of tasks is not directly related to how frequently they are performed. However, task frequency is significantly correlated to competence for both PAs ($r = .5459$, $p < .005$) and NPs ($r = .6794$, $p < .005$), i.e., the less competence the less the performance frequency. As expected, medical complexity and task competence were inversely correlated for both PAs ($r = -.6409$, $p < .005$) and NPs ($r = -.4834$, $p < .005$), i.e. the more complex the task the less the competence.

The ten most fequently performed medical tasks by physicians, PAs and NPs are described in Table 5.7. In addition to frequency, mean complexity and competency ratings are also furnished for each role. The average complexity for each role's ten most frequently performed tasks do not differ substantially from physicians (3.38) to PAs (3.34) to NPs (3.01), where higher numbers reflect greater complexity. It is possible that the original fifty medical tasks did not include all the most complex NP functions, and had they been included, the small difference might have been reduced.

Table 5.7
Ten Most Frequently Performed Medical Tasks

Physicians		Mean (standard deviation)	
Rank	Task	Complexity*	Frequency*
1	37 Otoscopy	2.88 (0.84)	4.42 (0.88)
2	3 Medical History	3.13 (1.46)	4.05 (1.09)
3	39 Examine Retina	3.75 (0.71)	4.00 (1.12)
4	8 General Physical	3.75 (0.47)	3.78 (1.31)
5	35 Acute Otis Media	3.00 (1.16)	3.77 (1.22)
6	25 Treat Diarrhea	3.50 (0.93)	3.75 (1.17)
7	36 Acute Otitis Externa	3.00 (1.07)	3.64 (1.23)
8	26 Abdominal Pain	4.00 (0.76)	3.52 (1.50)
9	34 Emotional Counseling	3.50 (0.54)	3.47 (1.24)
10	28 Prostrate gland	3.25 (0.46)	3.44 (1.48)
	Average	3.38	

Physician Assistants		Mean (standard deviation)		
Rank	Task	Complexity*	Frequency*	Competence*
1	37 Otoscopy	2.88 (0.84)	4.90 (0.37)	1.14 (0.53)
2	35 Acute Otitis Media	3.00 (1.16)	4.69 (0.59)	1.43 (0.85)
3	36 Acute Otitis Externa	3.00 (1.07)	4.62 (0.60)	1.43 (0.85)
4	7 Strep Throat	2.38 (0.74)	4.59 (0.78)	1.43 (0.85)
5	26 Abdominal Pain	4.00 (0.76)	4.53 (0.63)	1.86 (0.86)
6	25 Treat Diarrhea	3.50 (0.93)	4.50 (0.63)	1.86 (0.86)
7	39 Examinine Retina	3.75 (0.71)	4.44 (0.79)	1.50 (0.85)
8	27 Chest Pain	4.50 (0.54)	4.43 (0.73)	1.86 (0.86)
9	28 Prostrate Gland	3.25 (0.46)	4.40 (0.75)	1.57 (0.94)
10	3 Medical History	3.13 (1.46)	4.34 (0.97)	1.43 (0.85)
	Average	3.34	--	1.55

Nurse Practitioners		Mean (standard deviation)		
Rank	Task	Complexity*	Frequency*	Competence*
1	3 Medical History	3.13 (1.46)	4.03 (1.22)	1.00 (0.00)
2	37 Otoscopy	2.88 (0.84)	3.93 (1.56)	1.00 (0.00)
3	25 Treat Diarrhea	3.50 (0.93)	3.41 (1.51)	1.17 (0.41)
4	26 Abdominal Pain	4.00 (0.76)	3.39 (1.42)	1.17 (0.41)
5	8 General Physical	3.75 (0.46)	3.37 (1.68)	1.00 (0.00)
6	7 Strep Throat	2.38 (0.74)	3.35 (1.65)	1.17 (0.41)
7	35 Acute Otitis Media	3.00 (1.16)	3.33 (1.75)	1.17 (0.41)
8	36 Acute Otis Externa	3.00 (1.07)	3.25 (1.72)	1.17 (0.41)
9	6 Throat Cultures	1.50 (0.54)	3.23 (1.38)	1.00 (0.00)
10	22 Teach Breast Exam	3.00 (0.76)	3.23 (1.67)	1.00 (0.00)
	Average	3.01	--	1.09

*Key to data codes:
Complexity = 1 = very easy, 5 = very complex
Frequency = 1 = almost never perform, 5 = quite frequently perform
Competency = 1 = can perform, no supervision, 5 = cannot perform

In terms of competence, the ten most frequent NP tasks have an average rating of 1.09, while the compariable average for PAs is 1.55. Thus it appears that NPs are performing tasks for which their trainers think they are very competent, while PAs are performing tasks for which they are still well qualified. However, these results must be regarded as tentative since the number of NP trainers in our survey was quite small (N = 6).

It may be interesting to note in Table 5.8 that nine of the ten most frequent medical tasks for MDs are also frequently performed by PAs and NPs. Thus it appears that utilization patterns indicate some degree of substitution for physicians by PAs and NPs.

II. C. Satisfaction of Providers

The final effectiveness measure used in the research is satisfaction of persons within each of the roles. Satisfaction measures not only indicate the individual's attitudes toward his work setting, thus his propensity to cause quality and behavioral problems, but can indicate possible organizational inefficiencies as well. We obtained assessments of satisfaction with eight specific aspects of each respondent's job (satisfaction with supervisor, with status of their job, with salary, with the work itself, with educational and training opportunities, with autonomy and independence, with career progress to date, and with future career prospects) as well as overall satisfaction. Table 5.9 and 5.10 summarize results for each role.

Overall, physicians and corpsmen are the most dissatisfied groups, followed by PAs and nurses, with NPs and AMOSISTs being most satisfied. Over 30% of the physicians surveyed expressed themselves as either "very dissatisfied" or somewhat dissatisfied, while the next most dissatisfied group

Table 5.8
Ten Most Frequently Performed Medical Tasks
(All Services)

Role Commonalities

	Rank of Task Frequencies			
MEDTASK	MD	PA	NP	Complexity
37 Otoscopy	1	1	2	2.88
3 Medical History	2	10	1	3.13
35 Treat Acute Otitis Media	5	2	7	3.00
25 Treat Diarrhea	6	6	3	3.50
36 Treat Acute Otitis Externa	7	3	8	3.00
26 Abdominal Pain	8	5	4	4.00
28 Prostate Gland	10	9		3.25
8 General Physical	4		5	3.75
39 Examine Retina	3	7		3.75
7 Strep Throat		4	6	2.38
34 Emotional Counseling	9			3.50
27 Chest Pain		8		4.50
6 Throat Cultures			9	1.50
22 Teach Breast Exam			10	3.00

Table 5.9
Provider Satisfaction

Average (std. error) satisfaction, on a five-point scale (1 = very dissatisfied, 5 = very satisfied)

Satisfaction with	Role					
	MD	N	PA	NP	AMOSIST	HM
Supervisor	3.576	3.993	3.980	3.988	4.151	3.840
	(.056)	(.059)	(.073)	(.067)	(.101)	(.048)
Status	3.645	3.961	3.256	4.117	3.706	3.575
	(.055)	(.059)	(.093)	(.062)	(.123)	(.050)
Salary	2.860	4.397	2.061	4.112	2.874	2.919
	(.063)	(.045)	(.080)	(.063)	(.123)	(.050)
Work itself	3.371	3.849	4.264	4.309	4.356	3.792
	(.056)	(.057)	(.061)	(.055)	(.086)	(.045)
Education opportunities	2.545	3.575	2.894	3.534	3.592	3.349
	(.059)	(.064)	(.091)	(.072)	(.128)	(.051)
Autonomy	3.636	3.919	4.297	4.367	4.134	3.715
	(.053)	(.059)	(.054)	(.052)	(.092)	(.047)
Career to date	3.476	4.052	3.731	4.292	4.059	3.618
	(.053)	(.057)	(.082)	(.052)	(.093)	(.047)
Career opportunities	3.234	3.600	2.490	3.461	3.339	3.059
	(.057)	(.065)	(.089)	(.069)	(.131)	(.054)
Overall	3.359	3.975	3.975	4.255	4.314	3.799
	(.059)	(.054)	(.072)	(.060)	(.088)	(.047)

Table 5.10
Provider Satisfaction--Summary of Findings

Overall Satisfaction (from least to most satisfied)

Role	Avg. (std. error) satisfaction	Percent expressing "very" or or "somewhat dissatisfied"
Physician	3.359 (.059)	30.9%
Corpsman	3.799 (.047)	19.3
PA	3.975 (.072)	16.8
Nurse	3.975 (.054)	14.5
NP	4.255 (.060)	10.7
AMOSIST	4.314 (.088)	16.1

Salary

Role	Avg. (std. error) satisfaction	Pct. "very" or "somewhat dissatisfied"
PA	2.061 (.080)	75.5%
Physician	2.860 (.063)	45.8
AMOSIST	2.874 (.121)	43.7
Corpsman	2.919 (.050)	42.5
NP	4.112 (.063)	14.3
Nurse	4.397 (.045)	6.0

Work Itself

Role	Avg. (std. error) satisfaction	Pct. "very" or "somewhat dissatisfied"
Physician	3.371 (.056)	31.4%
Corpsman	3.792 (.045)	17.4
Nurse	3.849 (.057)	17.6
PA	4.264 (.061)	7.3
NP	4.309 (.055)	8.6
AMOSIST	4.356 (.086)	6.8

Education and Training

Role	Avg. (std. error) satisfaction	Pct. "very" or "somewhat dissatisfied"
Physician	2.545 (.059)	54.7%
PA	2.894 (.091)	45.7
Corpsman	3.349 (.051)	29.3
NP	3.534 (.072)	27.8
Nurse	3.575 (.064)	25.2
AMOSIST	3.592 (.128)	24.2

Career Opportunities

Role	Avg. (std. error) satisfaction	Pct. "very" or "somewhat dissatisfied"
PA	2.490 (.089)	60.5%
Corpsman	3.059 (.054)	38.5
Physician	3.234 (.057)	27.0
AMOSIST	3.339 (.131)	32.2
NP	3.461 (.069)	23.7
Nurse	3.600 (.065)	23.0

(corpsmen) had only 19.3% of the responses in those categories.

III. Effects of Paramedic Usage on Recipients of Care

The quality of care delivered by paramedical personnel was ascertained indirectly by examining the specific tasks performed by each group and correlating frequency with indicies of appropriateness and complexity developed for each task. The degree of automony and freedom of decision making in medical tasks for each group is also examined, since quality is assured for some groups, in theory, through fairly rigid organizational controls. Finally, some specific attitudes regarding each respondent's working environment are examined, including the respondent's own assessment of the adequacy of his training. Since patient attitudes were not measured in the study no firm conclusions can be drawn concerning patient acceptance of the paramedical concept. However, a number of informal discussions did indicate a high rate of patient approval, as measured by few complaints, requests for repeat service by specific paramedics, and volunteer patient comments. These results are consistent with findings reported in the literature, as discussed in Chapter 2 of this report.

Quality of care studies in the literature are generally fragmentary or are based on subjective data. What data do exist for MHPs (PAs and NPs) indicate that they deliver adequate care, at last as good as and perhaps better than physicians. Outcome statistics for MHPs in various studies have been shown to be better than those for physicians, in many cases, but it must be realized that it is difficult to control for patient characteristics in such studies. In examining process standards, MHPs have been found to practice "conservative" medicine, and to make proper medical judgments in their area of competence.

Data gathered in this research indicated that there seems to be no problem with the appropriateness or complexity of tasks performed by various practitioners. As discussed in the previous section, the frequency with which various tasks are performed is significantly correlated to perceived competence to perform such tasks. For no task was a misuse of a medical role found, where misuse is defined as a role frequently performing a task for which it is judged unsuited.

Responses to the question "To what extent do you feel you have been adequately trained to perform your assigned tasks?" are summarized in Table 5.11. In examining these data, two observations seem pertinent. First, the traditional non-physician roles (nurses and corpsemen) see themselves as generally less adequately trained than average, while NPs, AMOSISTs, and PAs perceive themselves as better trained. Second, the PAs perceive themselves as exceptionally well prepared for their assigned tasks, better even than physicians. Perhaps this is indeed so; the PA is seen as a provider of relatively straightforward procedures, and it may be that this role is sufficiently well defined and integrated with training programs so that PAs are truly better prepared for their role than physicians are for the more complex physician role. Alternatively, however, one must consider the possibility that PAs may be over-confident, perhaps leading to PAs practicing beyond there capabilities. The safeguard against such a possibility is the supervisory relationship between a practicing PA and his supervising physician. Supposedly the PA works with a physician who insures the propriety and quality of PA-delivered care.

A number of questions were designed to probe the strength of supervisory relationships. Reponses are summarized in Table 5.12. All groups see a

Table 5.11
Perceived Adequacy of Training

Question: To what extent do you feel you have been adequately trained to perform your assigned tasks?

Responses:
1. To a very little extent
2. To a little extent
3. To some extent
4. To a great extent
5. To a very great extent

Role	Mean Response	Std. Error	Percent Giving Response of 1, 2, or 3
Physician Assistant	4.472	0.041	4.8%
Physician	4.412	0.034	11.8
AMOSIST/NAMIC	4.319	0.073	15.9
Nurse Practitioner	4.142	0.051	20.1
Nurse	3.945	0.046	27.2
Corpsman	3.849	0.040	30.0
Overall	4.140	0.019	20.2

Table 5.12
Strength of Supervisory Relationships

For each question, responses are coded on a scale of 1 to 4 where, 1 = definitely false, 4 = definitely true.

	Mean (standard error) response for						
	MD	Nurse	PA	NP	AMOS-IST	Corps-man	Over-all
For medical tasks:							
- procedures exist for all situations	3.136 (.030)	3.230 (.030)	3.202 (.043)	3.131 (.037)	3.437 (.058)	3.311 (.026)	3.228 (.014)
- strict operating procedures followed at all times	2.786 (.033)	3.037 (.033)	2.895 (.049)	2.828 (.045)	3.244 (.074)	3.152 (.028)	2.983 (.015)
- generally must ask supervisor before doing anything	1.347 (.028)	1.778 (.037)	1.297 (.035)	1.591 (.040)	1.881 (.084)	1.919 (.033)	1.663 (.016)
- generally, decisions must have supervisor approval	1.454 (.033)	1.979 (.040)	1.524 (.051)	1.758 (.047)	2.237 (.100)	2.205 (.037)	1.873 (.019)

fairly strict working environment in terms of procedures, with the physicians and NPs perceiving slightly less procedural orientation than the other roles. The two questions on supervisory relationships (the first asking if supervisor approval is necessary before performing medical tasks, and the second asking if medical decisions must have supervisory approval in general, without specifying when the approval is granted) indicate that the physician and the PA see very little approval required. The PA, in fact, perceives even less emphasis on prior approval than physicians, while on the "general approval required" question the PA is second only to physicians, both these roles being significantly below the other groups.

In light of the preceeding comments on perceived adequacy of training, one must raise the question of quality safeguards on PA-delivered care. The PA sees himself as exceptionally well trained. This may be true, but since the supervisory relationships perceived by the PA is exceptionally loose, he may to some extent be working in a vacuum. This does not mean that PAs are delivering poor quality care. It is possible that the autonomy granted PAs is a result of actual competence, and may act as an informal institutional reward for PAs. These data are cause for concern only if there is apprehension about the quality of PA-delivered care, and in the absence of definitive studies of the quality of PA-delivered care little can be said. It should also be noted that nurses, corpsmen, and AMOSISTs do perceive a higher degree of control than other roles, but even their responses show a large degree of autonomy. It is difficult, however, to interpret these results in absolute terms.

Some questions regarding the respondents' perceptions of their work environment also involved quality issues. Responses for these questions are

summarized in Table 5.13. All groups perceive their work groups as maintaining high performance standards, including performance under pressure or in emergency situations. Responses for each group showed a good deal of confidence and trust in other members of the work group, and indicated mutual help in solving job-related problems. There is less information flow than desireable, both laterally and vertically, but it is unclear whether information on patients and medical procedures is lacking, or whether the lack refers to administrative information. Given the high degree of confidence placed on standards of performance, it is probably the latter. Both motivation and feelings of self-worth were also high. Comparing responses across roles indicates that physicians and corpsmen give consistently lower scores on all these measures than those in other roles, even though the absolute values of their responses are still high. Lowest and second-lowest scores are given by physicians or corpsemen on seven out of eight questions. The only exception is the question on information from other departments, where the physician was relatively high. These data parallel the findings of dissatisfaction of physicians and corpsmen, as discussed above in Section II. C. It is possible that their unhappiness is translated to negative feelings about peers, work groups, the communication structure, and other aspects of the work. In any case, physicians and corpsmen are not the groups concerning which quality issues have been raised.

IV. Role Definitions and Optimal Mix of Providers

The precise roles to be played by paramedical personnel are not well defined in the armed forces. The literature review indicated the roles of NPs and PAs in particular are very unclear in both civilian and military practice. In addition, there is very little written about the optimal mix

Table 5.13
Working Environment--Quality Related Issues

For each question, responses are coded on a scale of 1 to 5 where, 1 = to a very little extent, 5 = to a very great extent

	Mean (standard error) response for						
	MD	Nurse	PA	NP	AMOS-IST	Corps-man	Over-all
People in work group maintain high standards of performance	4.093 (.033)	4.234 (.035)	4.170 (.046)	4.236 (.043)	4.353 (.071)	4.011 (.030)	4.143 (.015)
Members of work group offer each other help in solving job-related problems	3.990 (.037)	4.005 (.043)	4.191 (.056)	4.044 (.056)	4.387 (.078)	3.929 (.038)	4.027 (.019)
To what extent do you have confidence and trust in members of work group?	4.096 (.036)	4.178 (.039)	4.210 (.052)	4.217 (.050)	4.254 (.096)	3.979 (.038)	4.117 (.018)
Members of work group perform well under pressure, in emergency situations	3.998 (.037)	4.237 (.037)	4.166 (.049)	4.140 (.046)	4.356 (.070)	4.141 (.031)	4.143 (.016)
Are you told what you need to know to do job in the best possible way?	3.161 (.053)	3.580 (.053)	3.528 (.072)	3.586 (.068)	4.202 (.101)	3.495 (.044)	3.481 (.024)
Is the amount of information about what is going on in other departments adequate?	3.080 (0.45)	3.387 (.049)	3.036 (.064)	3.056 (.056)	3.193 (.101)	3.042 (.042)	3.138 (.021)
Do you feel motivated to contribute your best efforts to the command's mission and tasks?	3.497 (.054)	4.087 (.046)	3.785 (.069)	3.975 (.059)	4.076 (.097)	3.723 (.042)	3.813 (.022)
Does your assigned work give you feelings of pride and self-worth?	3.613 (.052)	3.927 (.051)	4.194 (.058)	4.320 (.051)	4.331 (.081)	3.797 (.045)	3.925 (.023)

of providers in various situations. In this project we concentrate on determining whether de facto role definitions have evolved in a relatively consistent manner, and if so what those roles are. Each respondent was also asked to evaluate the importance of all the medical roles in the health care setting, and to give his perceptions of which roles were most influential in both medical and administrative matters. These data indicate the degree to which the different groups are recognized as having a legitimate place on the health care team, both by themselves and by others. A number of questions also probe the progress of the respondent toward meeting career objectives, indicating the degree of integraion of the role into a successful career pattern.

IV.A. De Facto Role Segregation

De facto role segregations among the roles in terms of practice settings, type of patient served, and type of care delivered were found to exist. These finds are discussed in Section II.A. of this chapter. These differences were explored further through examining the medical tasks performed by each group. If the roles are indeed functionally distinct, as opposed to organizationally distinct, one should be able to identify groups of tasks typically performed by each role, and examine how often a PA, for example, is classified as performing "NP-like" tasks rather than "PA-like" tasks. The greater the de facto separation of the roles, the fewer such misclassifications should result.

A discriminate analysis was performed on the medical tasks performed by each role. This methodology develops statistical profiles for each medical role according to how frequently each medical task is performed, and

then attempts to predict the role of each respondent by comparing his responses to the various profiles for each role. Discriminant analyses were performed on physicians, nurses, and corpsmen, physician assistants, and nurse practitioners. Analyses were performed separately for each military service. Results are summarized in Tables 5.14 through 5.16. Each table incidates the number of respondents by actual role and predicted role, as well as the total percentage of correct predictions. Each table also furnishes the ten most strongly discriminating medical tasks and the average responses by actual role. Medical tasks that were discriminating for more than one service are noted in Table 5.17.

This analysis yielded the following general results:

1. There is very little confusion among tasks performed by nurses and PAs, nurses and physicians, and nurses and NPs. Thus the nursing function seems to be well defined as substantially different from the other three roles. A substantial percentage of nurses (18% to 28%, depending on the service) is classified as doing corpsman-like duties, but relatively few corpsmen are misclassified as nurses, probably indicating that nurses have a significant set of skills beyond those of the corpsman.

2. Almost no PAs are misclassified as NPs, and almost no NPs are misclassified as PAs except in the Air Force, where 14.6% of the NPs are so misclassified. Thus, there seems to be a definite functional distinction between the roles in the Army and Navy. The Air Force result can be explained by our field observations that Air Force PAs and NPs often work in the same physical location. Thus, the Air Force NPs see not only NP-type patients but many of the patients which in other services would be seen by PAs. This would lead to the NPs performing tasks that are more

Table 5.14
Prediction Results of Discriminant Analysis

ARMY

Actual Group	No. of Cases	Predicted Group Membership MD	N	PA	NP	HM
Physician (MD)	113	96 85.0%	1 0.9%	3 2.7%	11 9.7%	2 1.8%
Nurse (N)	57	1 1.8%	41 71.9%	0 0%	3 5.3%	12 21.1%
Physician Assistant (PA)	34	3 8.8%	0 0%	30 88.2%	1 2.9%	0 0%
Nurse Practitioner (NP)	82	4 4.9%	3 3.7%	0 0%	73 89.0%	2 2.4%
Corpsmen (HM)	82	0 0%	5 6.1%	2 2.4%	3 3.7%	72 87.8%

Percent of "Predicted Group" Cases Correctly Classified: 84.78%

Ten Most Strongly Discriminating Variables:

	Variable	Average Responses by Role*				
1.	MEDTSK 28 Prostate Gland	3.69	1.18	4.38	1.81	1.30
2.	MEDTSK 12 Collect Urine	1.22	3.74	1.97	2.07	3.30
3.	MEDTSK 32 Diabetes	2.82	1.20	1.44	2.43	1.09
4.	MEDTSK 29 Sigmoidoscopy	2.37	1.07	1.24	1.00	1.04
5.	MEDTSK 15 Family Planning	1.93	1.77	1.82	2.48	1.28
6.	MEDTSK 45 Drain Abscess	2.64	1.42	3.65	1.30	2.55
7.	MEDTSK 39 Examine Retina	4.04	1.38	4.38	2.97	1.49
8.	MEDTSK 11 Intravenous Fluids	2.27	3.72	2.18	1.63	2.73
9.	MEDTSK 1 Height/Weight/Blood	2.12	3.58	3.12	3.30	3.86
10.	MEDTSK 13 Foley Catheters	1.27	1.38	1.29	1.04	1.87

*Responses range from 1 = almost never, to 5 = quite frequently.

Table 5.15
Prediction Results of Discriminant Analysis

NAVY

Actual Group	No. of Cases	Predicted Group Membership MD	N	PA	NP	HM
Physician (MD)	129	98	1	15	9	6
		76.0%	0.8%	11.6%	7.0%	4.7%
Nurse (N)	39	0	27	0	1	11
		0%	69.2%	0%	2.6%	28.2%
Physician Assistant (PA)	51	6	0	43	2	0
		11.8%	0%	84.3%	3.9%	0%
Nurse Practitioner (NP)	44	0	1	2	38	3
		0%	2.3%	4.5%	86.4%	6.8%
Corpsman (HM)	125	3	4	1	4	113
		2.4%	3.2%	0.8%	3.2%	90.4%

Percent of "Predicted Group" Cases Correctly Classified: 82.22%

Ten Most Strongly Discriminating Variables:

	Variable	Average Responses by Role*				
1.	MEDTSK 39 Examine Retina	4.02	1.17	4.51	3.51	1.94
2.	MEDTSK 28 Prostate Gland	3.31	1.06	4.35	2.02	1.52
3.	MEDTSK 43 Suture Laceration	2.92	1.31	3.86	1.70	2.90
4.	MEDTSK 11 Intravenous Fluid	2.21	3.90	2.65	1.93	2.22
5.	MEDTSK 1 Height/Weight/Blood	2.32	3.54	2.84	2.93	3.90
6.	MEDTSK 32 Diabetes	3.00	1.31	2.43	1.70	1.12
7.	MEDTSK 22 Teach Breast Exam	2.84	1.68	3.12	3.57	1.38
8.	MEDTSK 37 Otoscopy	4.48	2.00	4.86	4.68	3.42
9.	MEDTSK 7 Strep Throat	3.24	1.81	4.78	4.02	2.74
10.	MEDTSK 5 Distinguish Abnormal ECG	3.42	1.82	3.08	1.67	1.65

*Responses range from 1 = almost never, to 5 = quite frequently.

Table 5.16
Prediction Results of Discriminant Analysis

AIR FORCE

Actual Group	No. of Cases	Predicted Group Membership MD	N	PA	NP	HM
Physician (MD)	310	245	0	35	20	10
		79.0%	0%	11.3%	6.5%	3.2%
Nurse (N)	66	1	49	0	4	12
		1.5%	74.2%	0%	6.1%	18.2%
Physician Assistant (PA)	157	23	0	132	1	1
		14.6%	0%	84.1%	0.6%	0.6%
Nurse Practitioner (NP)	164	5	2	24	130	3
		3.0%	1.2%	14.6%	79.3%	1.8%
Corpsman (HM)	327	1	8	5	3	310
		0.3%	2.4%	1.5%	0.9%	94.8%

Percent of "Predicted Group" Cases Correctly Classified: 84.57%

Ten Most Strongly Discriminating Variables:

Variable	Average Responses by Role*				
1. MEDTSK 28 Prostate Gland	3.41	1.05	4.42	1.63	1.38
2. MEDTSK 4 Take ECG	1.29	2.15	1.43	1.19	3.02
3. MEDTSK 22 Teach Breast Exam	2.57	1.62	2.85	3.23	1.08
4. MEDTSK 32 Diabetes	2.87	1.16	2.22	1.28	1.06
5. MEDTSK 43 Suture Laceration	2.48	1.23	2.50	1.41	3.33
6. MEDTSK 35 Acute Otitis Media	3.81	1.45	4.68	3.34	2.64
7. MEDTSK 11 Intravenous Fluids	2.25	3.43	1.90	1.66	2.10
8. MEDTSK 46 Tape Ankle/Wrist/ Knee	2.13	1.94	2.69	1.58	3.48
9. MEDTSK 39 Examine Retina	3.97	1.18	4.43	2.82	1.72
10. MEDTSK 33 Hypertension Medication	2.65	1.30	3.39	1.40	1.17

*Responses range from 1 = almost never, to 5 = quite frequently.

Table 5.17
Summary of Ten Strongest Discriminatory Variables

Variable		Discriminatory Rank For Army	Navy	Air Force
Medtask	1 Height/Weight/Blood	9	5	-
	4 Take ECG	-	-	2
	5 Distinguish Abnormal ECG	-	10	-
	7 Strep Throat	-	9	-
	11 Intravenous Fluid	8	4	7
	12 Collect Urine	2	-	-
	13 Foley Catheters	10	-	-
	15 Family Planning	5	-	-
	22 Teach Breast Exam	-	7	3
	28 Prostate Gland	1	2	1
	29 Sigmoidoscopy	4	-	-
	32 Diabetes	3	6	4
	33 Hypertension Medication	-	-	10
	35 Acute Otitis Media	-	-	6
	37 Otoscopy	-	8	-
	39 Examine Retina	7	1	9
	43 Suture Laceration	-	3	5
	45 Drain Abscess	6	-	-
	46 Tape Ankle/Wrist/Knee	-	-	8

typical of PAs. The switching of patients would not take place the other way (i.e., with PAs seeing NP-type patients) since PAs don't generally perform the specialized dependent-related care that NPs often do.

3. About 9% to 14% of the PAs are misclassified as physicians, with the Army (where PAs work in a remote setting) having the lowest incidence of misclassification. In addition, about 11% of physicians are misclassified as PAs in the Navy and Air Force. This may indicate that PAs are, to a large extent, doing "physician-like" tasks, and effectively replacing physicians for some types of care.

A final qualification concerning this analytic method is that the specific choice of the fifty medical tasks on the questionnaire may influence the results. However, had a more comprehensive and representative set of tasks been used, it is felt that the discriminations found here would only have been strengthened.

IV.B. Importance and Influence of Medical Provider Roles

Respondents were asked to assess the medical and administrative power and influence of themselves and of all the other roles. They were also asked to judge the value of each role in providing quality medical care. Results are tabulated in Tables 5.18 through 5.21.

All roles, on the average are valued at 2 or better on a five point scale, where 1 is defined as "very valuable, perform essential tasks" and 5 is "definitely not needed." All roles scored themselves as more important than the total sample did, which is understandable. Physicians are judged significantly more and AMOSISTs significantly less valuable than other roles; while average values assigned other roles do not differ significantly. The

Table 5.18
Perceived Medical Power and Influence of Each Role

Responses are coded on a sale of 1 to 5 where, 1 = little or no influence, 5 = a very great deal of influence.

Role of Evaluator	Average (standard error) influence of						
	Self	MD	Nurse	PA	NP	AMOSIST	Corpsman
MD	3.990 (.052)	4.152 (.047)	2.709 (.046)	2.736 (.052)	2.920 (.052)	2.221 (.085)	1.978 (.041)
Nurse	3.550 (.062)	4.521 (.044)	3.440 (.059)	3.078 (.093)	3.383 (.081)	2.372 (.144)	2.350 (.052)
PA	2.917 (.084)	4.326 (.066)	2.344 (.086)	3.173 (.083)	2.693 (.096)	1.820 (.124)	1.815 (.060)
NP	3.067 (.073)	4.397 (.055)	2.438 (.070)	2.674 (.112)	3.440 (.072)	1.907 (.148)	1.966 (.071)
AMOSIST	2.846 (.122)	4.621 (.087)	2.737 (.158)	2.732 (.200)	2.903 (.191)	3.321 (.120)	1.885 (.118)
Corpsman	2.684 (.049)	4.449 (.039)	3.289 (.053)	3.201 (.065)	3.160 (.065)	2.482 (.102)	2.494 (.047)
Overall	3.223 (.028)	4.375 (.021)	2.956 (.027)	2.970 (.032)	3.117 (.030)	2.424 (.050)	2.182 (.023)
Percent of sample answering Do Not Know/No Opinion	2.3	6.4	17.1	35.6	29.6	68.9	12.4

Table 5.19
Perceived Administrative Power and Influence of Each Role

Responses are coded on a scale of 1 to 5 where, 1 = little or no influence, 5 = a very great deal of influence.

Role of Evaluator	Average (standard error) influence of						
	Self	MD	Nurse	PA	NP	AMOSIST	Corpsman
MD	2.938 (.061)	2.761 (.053)	2.476 (.049)	2.017 (.051)	2.272 (.054)	2.111 (.082)	1.823 (.042)
Nurse	3.426 (.068)	3.041 (.066)	3.007 (.065)	2.179 (.089)	2.500 (.086)	2.063 (.132)	1.990 (.051)
PA	1.965 (.073)	2.779 (.086)	2.456 (.094)	2.112 (.073)	1.935 (.075)	1.490 (.113)	1.614 (.058)
NP	2.472 (.076)	3.303 (.081)	2.349 (.073)	2.031 (.096)	2.608 (.076)	1.795 (.151)	1.850 (.071)
AMOSIST	2.239 (.123)	3.469 (.137)	2.378 (.149)	2.018 (.175)	2.186 (.165)	2.606 (.135)	1.610 (.114)
Corpsman	2.483 (.052)	3.011 (.053)	2.800 (.057)	2.408 (.067)	2.505 (.066)	2.384 (.109)	2.107 (.045)
Overall	2.744 (.029)	2.989 (.028)	2.642 (.028)	2.158 (.030)	2.388 (.030)	2.166 (.049)	1.913 (.022)
Percent of sample answering Do Not Know/No Opinion	2.9	9.2	18.5	37.6	31.9	68.5	13.0

Table 5.20
Perceived Importance of Each Role

Responses are coded on a scale of 1 to 5 where, 1 = very valuable/perform essential tasks, 5 = definitely not needed

Role of Evaluator	Average (standard error) importance of MD	Nurse	PA	NP	AMOSIST	Corpsman
MD	1.093 (.015)	1.512 (.034)	1.662 (.035)	1.708 (.040)	2.102 (.079)	1.915 (.039)
Nurse	1.205 (.026)	1.274 (.029)	1.802 (.059)	1.438 (.043)	2.170 (.109)	1.499 (.038)
PA	1.118 (.028)	2.147 (.070)	1.255 (.030)	1.740 (.061)	2.264 (.120)	1.930 (.053)
NP	1.131 (.025)	1.481 (.045)	1.597 (.065)	1.192 (.027)	2.219 (.133)	1.694 (.051)
AMOSIST	1.052 (.024)	2.292 (.132)	1.830 (.119)	1.912 (.128)	1.407 (.066)	2.240 (.117)
Corpsman	1.146 (.018)	2.030 (.044)	1.792 (.044)	2.093 (.051)	2.352 (.106)	1.544 (.029)
Overall	1.135 (.009)	1.703 (.020)	1.667 (.020)	1.691 (.021)	2.102 (.042)	1.710 (.018)
Percent of sample answering Do Not Know/No Opinion	1.3	3.4	15.7	14.0	6.16	3.2

Table 5.21
Comparison of Importance Perceptions with
Power and Influence Perceptions

Role	Importance, as perceived by*		Administrative Power as perceived by**			Medical Power as perceived by**		
	Role Members	Total Sample	Self	Role Members	Total Sample	Self	Role Members	Total Sample
MD	1.093	1.135	2.938	2.761	2.989	3.990	4.152	4.375
	(.015)	(.009)	(.061)	(.053)	(.028)	(.052)	(.047)	(.021)
Nurse	1.274	1.703	3.426	3.007	2.642	3.550	3.440	2.956
	(.029)	(.020)	(.068)	(.065)	(.028)	(.062)	(.059)	(.027)
PA	1.255	1.667	1.965	2.112	2.158	2.917	3.173	2.970
	(.030)	(.020)	(.073)	(.073)	(.030)	(.084)	(.083)	(.032)
NP	1.192	1.691	2.472	2.608	2.388	3.067	3.440	3.117
	(.027)	(.020)	(.076)	(.076)	(.030)	(.073)	(.072)	(.030)
AMOSIST	1.407	2.102	2.239	2.606	2.166	2.846	3.321	2.424
	(.066)	(.042)	(.123)	(.135)	(.049)	(.122)	(.120)	(.050)
Corpsman	1.544	1.710	2.483	2.107	1.913	2.684	2.494	2.182
	(.029)	(.018)	(.052)	(.045)	(.022)	(.049)	(.047)	(.023)

*Scaled from 1 to 5 where, 1 = very valuable/perform essential tasks, 5 = definitely not needed.

**Scaled from 1 to 5 where, 1 = little or no influence, 5 = a very great deal of influence.

physician was also viewed as the most powerful role, both medically and administratively. Interestingly, the PA and NP were both viewed as having more medical influence than nurses, but administratively nurses ranked second only to physicians in influence. The PA, in fact, was fifth out of the six roles in administrative influence; only the corpsman ranked lower. Thus, in medical terms the new roles (NP and PA) seem to have established their competence, but in administrative matters the traditional role (nurse) is strongest, the NP (who is by training and background a nurse) follows, while the PA, who has neither tradition nor rank to strengthen his position, is relatively powerless. It should also be noted that large numbers (thirty to forty percent) of respondents had no opinion of, and presumably little contact with, NPs or PAs, while nearly seventy percent had no opinion of the AMOSIST role.

IV.C. Integration of Roles into Career Patterns

Respondents were queried specifically on the degree to which their position contributed toward their personal career goals. This was intended to measure the degree to which personal goals diverged from opportunities offered by the medical role, thus serving as an indicator of loyalty and commitment to the role and to the Armed Services. Some results which are summarized in Tables 5.9 and 5.10 in Section II.C. above, are repeated in Table 5.22 for convenience, along with additional data.

Examination of how well the medical roles fit into career patterns yielded mixed results. Physicans, PAs, and corpsmen, on the whole, feel that their present positions do little to enhance their careers, and are not especially happy about either the progress of their military careers

Table 5.22
Perceived Career Progress and Satisfaction

Mean (standard error) response for each role where,
- for question WKATT15
  1 = to a very little extent
  5 = to a very great extent

- for questions JOBSAT7 and JOBSAT8
  1 = very dissatisfied
  5 = very satisfied

Questions:	Role MD	Nurse	PA	NP	AMOSIST	Corpsman
- WKATT15: "To what extent (do) duties enhance your career?"	2.905 (.058)	3.673 (.058)	3.445 (.079)	3.882 (.063)	3.857 (.106)	3.383 (.049)
- JOBSAT7: "Satisfaction with career progress to date."	3.476 (.053)	4.052 (.057)	3.731 (.082)	4.292 (.052)	4.059 (.093)	3.618 (.047)
- JOBSAT8: Satisfac- with future career prospects.	3.234 (.057)	3.600 (.065)	2.490 (.089)	3.461 (.069)	3.339 (.131)	3.059 (.054)

Percent of respondents expressing
- "little" or "very little extent" for WKATT15
- "somewhat" or "very dissatisfied" for JOBSAT7 and JOBSAT8

Questions:	Role MD	Nurse	PA	NP	AMOSIST	Corpsman
- WKATT15	38.3%	16.0%	22.7%	10.5%	14.3%	22.7%
- JOBSAT7	18.9	13.3	20.8	6.6	10.2	22.7
- JOBSAT8	27.0	23.0	60.5	23.7	32.2	38.5

to date, or the chances for future progress. The PAs are particularly dissatisfied with the latter, with over 60% of the PAs expressing themselves as either somewhat or very dissatisfied. The NPs, AMOSISTs, and nurses, on the other hand, express more positive opinions on all three indicators.

The AMOSIST program is both new and relatively small, and the attitudes of the AMOSISTs could probably change more than those of other practitioners over time. The nurses and NPs, however, seem not only to be satisfied with their present positions, but to see viable and rewarding career paths as well.

V. Organizational Issues and Problems

The issues and findings discussed above indicate a number of organizational problems in military health care systems. Whenever a new role is integrated into an organization an established group is partially displaced, giving rise to a certain amount of friction. Some of the specific issues examined in this project are:

- satisfaction of each role with a number of aspects of their work and organizational setting, including rank and pay;
- comparison of each group's self-perceived importance and influence with that expressed by formal authority relationships and perceived by other groups;
- career-related values and the degree to which they are being attained; and
- Organizational commitment expressed by each groups, as ascertained both by direct questioning and by examining career enlistment intentions and expectations.

This last issue is of primary management importance in and of itself, of

course, as well as a symptom of possible underlying problems. Findings in each of these areas are discussed in turn.

V.A. Satisfaction with Work and Organizational Setting

A member of measure of satisfaction were used in this research, including satisfaction with one's supervisor, status, salary, educational opportunities, autonomy, career purposes to date, potential career progress, and with the content of one's work, as well as overall satisfaction. Results are discussed fully in Section II.C. of this chapter, while table 5.10 summarizes some of the major findings. For convenience, the major conclusions are repeated here. Physicians are the most dissatisfied group, being unhappy with salary, work content, educational opportunities, and career enhancement. Corpsmen are also dissatisfied, but seem to have no specific reason for being so. Nurses and PAs express average overall satisfaction, but the PA is very unhappy with salary, educational opportunities, status, and career opportunities. This leads one to expect that PAs are strongly second career oriented, even though they are quite happy with the work content of their position. The NPs, AMOSISTs and NAMICs are relatively satisfied with all aspects of their work.

V.B. Self-Perceived Importance and Influence vs. Perceptions of Others

As discussed in Section IV.B. of this chapter, respondents were asked to judge the value of each role in providing quality medical care. All groups were judged to be quite valuable, with the physician significantly more and the AMOSIT/NAMIC somewhat less valuable than the other roles. These results, as well as others to be discussed here, are tabulated in tables 5.17 to 5.20. We also examined which roles controlled administrative and

medical power from three different viewpoints:

(1) how much power does each role have, as perceived by the entire sample;

(2) How much power each respondent felt he personally had; and

(3) how much power each respondent felt his own role had (e.g., if the respondent were a PA he would judge the power of PAs in general).

Physicians were clearly judged to have the most administrative and medical power by the entire sample. Nurses, however, judged the nursing role to be practically equal to the physician role in administrative power, while the average nurse perceived himself as even more influential than other nurses. The average nurse, in fact, judged himself to be more powerful (administratively) than any other role, including physicians. Other respondents agreed in assigning a good deal of administrative influence to nurses, but not as much as they claimed for themselves. The same phenomenon can be seen in the perceptions of medical influence. The total sample assigns a rather low medical influence to nurses - fourth out of the six roles. However, nurses perceive the nursing role as being the second most influential in medical matters, and the average nurse sees himself as even more powerful than most nurses, though still less influential than physicians. This indicates that the nursing role is in transition. The nursing role has existed for many years, is firmly supported by formal authority and tradition, but now newer roles have gained medical expertise and influence greater than those of the traditional nurse. One could predict that administrative authority would follow medical influence, given sufficient time, but undoubtedly the nursing profession would resist if a serious threat to established authority patterns developed.

The PA currently experiences the converse of the nurse's pattern, with relatively high medical influence but very low administrative power. The average PA also sees himself as administratively and medically less powerful than PAs in general, reinforcing his sense of allienation from the military community. The NPs have relatively high power in both areas, and their self-perceptions concerning their influence are in agreement with perceptions of other. The NP comes from a nursing background and shares in the traditional nursing power structure in a number of ways, the most obvious being officer status, yet he is also more highly valued than nurses on medical influence.

The corpsman shares the misperception of the nurse, to some extent. Like the Nurse, he sees himself as having much more administrative power than others assign him, but unlike the nurse, he is assigned very low administrative power by the entire sample. The corpsman also sees the corpsman role in general as having little administrative or medical influence.

V.C. Career-Related Values

In Section IV.C. of this chapter we discussed responses to three career-related questions:

- (WKATTI5) to what extent do your current duties enhance your career;
- (JOBST7) how satisfied are you with the porgress you have made in the military up to now; and
- (JOBSAT8) how satisfied do you feel with your chances for getting ahead in the military in the future.

As discussed there and summarized in Tables 5.9, 5.10, and 5.2, physicians, PAs, and corpsmen are relatively dissatisfied with all three aspects of their careers, while the nurses and NPs are relatively satisfied.

Some possible reasons for the particular areas of dissatisfaction can be determined by examining basic values of the respondents. These are discussed below, then the satisfaction issue is reexamined.

V.C.1. Basic Values for Each Role

A section of the questionnaire (Part IV) was designed to elicit major career-related values from respondents. Schein's work on "career anchors" (i.e. basic values, motives, needs and talents which keep a person pursuing certain kinds of careers) demonstrates the importance of ascertaining primary work values (Schein, Ref. 73). If a person is managerially-oriented, for example, and is placed in a job calling for little interaction and use of authority he might become dissatisfied and leave. The five primary anchors discovered by Schein are: need for autonomy or independence at work, need for job security, need for technical-functional competence, need for managerial experience and need for exercising creativity on the job. These values tend to hold constant during much of the work life regardless of a particular switch in actual work assignments or places of employment. Finding a predominance of these anchors in various persons and role groups could help to adapt and enrich the quality of work life and to design jobs appropriate to satisfaction and retention. Derr's exploratory research among officers at the Naval Postgraduate School, for example (Derr, Ref. 25) indicates that the surface community is most managerially-oriented while aviators are more "technical-functional" and CEC officers more security-minded.

The data derived from these questions are summarized in Table 5.23.

These results indicate that the PA can be characterized as strongly preferring a career pattern which leads to technical competence and is less

Table 5.23
Career Values for Each Role

Responses are coded on scale of 1 to 5 where, 1 = to a very little extent, 5 = to a very great extent.

To what extent do you prefer a career which allows:	Mean (standard error) response for MD	Nurse	PA	NP	AMOS-IST	Corps-man	Over-all
Independence	3.407 (.054)	3.065 (.063)	3.177 (.073)	3.491 (.062)	3.417 (.115)	3.328 (.047)	3.296 (.025)
Outside (leisure) time	4.331 (.033)	4.230 (.041)	4.198 (.052)	4.220 (.046)	4.125 (.094)	4.120 (.036)	4.205 (.017)
Outstanding technical competence	4.219 (.038)	4.252 (.044)	4.617 (.042)	4.398 (.045)	4.588 (.065)	4.553 (.029)	4.412 (.017)
Administrative opportunities	2.350 (.053)	3.564 (.066)	1.992 (.069)	2.161 (.067)	3.160 (.127)	3.294 (.052)	2.891 (.029)
Early retirement	2.355 (.056)	3.242 (.067)	3.585 (.087)	3.128 (.075)	3.672 (.128)	3.639 (.049)	3.209 (.028)
Job security	2.914 (.061)	3.947 (.056)	3.814 (.078)	3.861 (.068)	4.202 (.108)	4.048 (.045)	3.727 (.026)
Creativity and innovation	4.110 (.038)	4.242 (.043)	4.089 (.060)	4.253 (.046)	4.336 (.086)	4.239 (.035)	4.212 (.018)

insistent upon autonomy, security and creativity than other roles. The PA is the least oriented toward administrative roles of any of the providers. These data correspond with field interviews, which show PAs as viewing themselves exclusively as providers of primary care. In many cases the PAs are quite autonomous, but they do not necessarily attach great value to work independence. Rather, they strongly value their technical competence and may welcome the opportunity to work in a setting where they learn from physicians.

The NPs express the strongest need for autonomy of any role, while their need for technical competence is somewhat below average (although still high in absolute terms). Field interviews revealed that NPs emphasize "traditional nursing" competences, which they define as "whole patient orientation," including patient education and counseling, and tend to deride "procedure oriented medicine," such as PAs are presumed to practice. If the NPs interpret "technical competence" as meaning "competence in procedure oriented medicine," this may explain their relatively low rating. The strong need for autonomy can be explained by a general attitude among NPs that the system doesn't appreciate their unique competences, thus there is a drive to create NP-oriented subpractices. NPs in the three services are worried that they will be unable to advance in rank as medical practitioners. They fear that at some point they will be forced to become administrators in order to progress up the hierarchy. While they have a slightly greater preference for managerial career experiences than PAs, perhaps because they are officers and former nurses, this career anchor is, nevertheless, low on their list.

The NPs are also relatively high in their value of job security. Two explanations are possible. First, many persons attracted to the military may be security-oriented. It is a more total organization than often found in the civilian world and much behavior is motivated by the promise of job

security and retirement benefits. Second, most NPs (and nurses) interviewed felt that they enjoyed relatively good pay, high status and interesting work as compared to their counterparts outside the military. They may be interested in preserving these job features and hence, put high value on securing their current positions.

Physicians, in keeping with their general dissatisfaction with military medical practice, show the least need for technical competence (though again, this is still high in absolute terms) and the strongest orientation toward outside acitivities. Military physicians often find their tasks uninteresting, and don't find their technical competence challenged. Physicians also have the least need for security and are least retirement-oriented of any role, consistent with a general "let's get it over with" orientation.

V.C.2. Satisfaction

V.C.2.a. The Physician Assistant

Returning again to the satisfaction issue mentioned at the beginning of this section, we see that the PAs would value training and education activities because they support their technical-functional career values, and because they are important activities for finding a job outside the military. In this regard, reference to Table 5.9 shows that next to physicians, PAs are the most dissatisfied of all role groups. Further, there is a significant difference among the services in satisfaction with educational opportunities, as summarized in Table 5.24. PAs in the Army work in the troop medical clinics away from the post hospital, and they report infrequent educational opportunities and feelings of isolation from the main medical group. Army PAs registered a very low satisfaction score on this education and training whereas Navy and Air Force PAs, who often work in major clinics

Table 5.24
Satisfaction Measures--Comparison Among Armed Services

Responses are coded on a scale of 1 to 5 where, 1 = very dissatisfied, 5 = very satisfied.

Satisfaction with	Mean (standard error) satisfaction of MD	Nurse	PA	NP	AMOS-IST	Corps-man
Educational opportunities						
Army	2.667	3.652	2.382	3.674	3.635	3.514
	(.140)	(.110)	(.264)	(.123)	(.134)	(.127)
Navy	2.519	3.478	3.135	3.178	3.200	3.410
	(.124)	(.150)	(.180)	(.214)	(.416)	(.103)
Air Force	2.455	2.603	2.911	3.542	--	3.276
	(.080)	(.098)	(.113)	(.101)	--	(.066)
Range (highest-lowest)	.212	.174	.753	.496	.435	.238
Salary						
Army	2.700	4.429	2.061	4.349	2.942	3.243
	(.141)	(.068)	(.226)	(.100)	(.131)	(.130)
Navy	3.053	4.435	2.173	4.133	2.267	2.851
	(.137)	(.104)	(.182)	(.179)	(.330)	(.096)
Air Force	2.759	4.510	2.019	4.113	--	2.836
	(.086)	(.065)	(.097)	(.085)	--	(.065)
Range (highest-lowest)	.353	.081	.154	.236	.675	.392
Staus						
Army	3.586	4.045	4.000	4.198	3.779	3.667
	(.133)	(.106)	(.202)	(.092)	(.129)	(.126)
Navy	3.458	4.022	3.288	4.044	3.071	3.783
	(.117)	(.130)	(.199)	(.188)	(.385)	(.091)
Air Force	3.723	3.938	3.070	4.167	--	3.460
	(.075)	(.093)	(.118)	(.089)	--	(.067)
Range (highest-lowest)	.265	.107	.930	.154	.708	.323

and hospitals and thus are exposed to relatively frequent meetings and inservice opportunities, registered higher scores.

The other major complaint of the PAs was in the area of rank and salaries. Given the nature of their work, the value others assign to their roles, their apparent physician extender competence and their own perceptions of themselves as full and important members of the medical team, they find it difficult to accept Warrent Officer pay and status in the Army and Navy. In the Air Force, the PAs are given Master Sergeant ranks (highest level of enlisted personnel) plus bonus pay; Table 5.24 shows that although satisfaction with salary is relatively constant, the satisfaction with status for Air Force PAs is significantly below those for the other two services.

PAs are all former enlisted men. Nevertheless, their referents are NPs and young physicians, both of whom are officers. PAs observe that they are doing comparable work as these persons for much less pay and status. In the case of the Air Force, they do the same work as NPs but, for example, they cannot go to lunch with them at the Officer's Club. Some PAs take the attitude that they are doing more interesting work than they did as medical corpsmen and that they are also preparing for their second career when they leave the military, hence, they can to some extent, downplay these feelings of "relative deprivation." Most, however, find this position untenable. They experience relative deprivation vis-a-vis their reference groups, both military and civilian, and this is a major source of dissatisfaction impacting on their work.

In examining the data obtained from PAs on satisfaction, (Table 5.25), one notices that PAs, while not generally satisfied as most other role sets, are not greatly dissatisfied. They do appear to be greatly satisfied

Table 5.25
Provider Satisfaction, Motivation, and Feelings of Worth

Average (std. error) satisfaction, on a five-point scale, 1 = very dissatisfied, 5 = very satisfied.

	Role					
Satisfaction with	MD	Nurse	PA	NP	AMOS-IST	Corps-man
Supervisor	3.576 (.056)	3.993 (.059)	3.980 (.073)	3.988 (.067)	4.151 (.101)	3.840 (.048)
Status	3.645 (.055)	3.961 (.059)	3.256 (.093)	4.117 (.062)	3.706 (.123)	3.575 (.050)
Salary	2.860 (.063)	4.397 (.045)	2.061 (.080)	4.112 (.063)	2.874 (.123)	2.919 (.050)
Work itself	3.371 (.056)	3.849 (.057)	4.264 (.061)	4.309 (.055)	4.356 (.086)	3.792 (.045)
Education Opportunities	2.545 (.059)	3.575 (.064)	2.894 (.091)	3.534 (.072)	3.592 (.128)	3.349 (.051)
Autonomy	3.636 (.053)	3.919 (.059)	4.297 (.054)	4.367 (.052)	4.134 (.092)	3.715 (.047)
Career to date	3.476 (.053)	4.052 (.057)	3.731 (.082)	4.292 (.052)	4.059 (.093)	3.618 (.047)
Career opportunities	3.234 (.057)	3.600 (.065)	2.490 (.089)	3.461 (.069)	3.339 (.131)	3.059 (.054)
Overall Satisfaction	3.359 (.059)	3.975 (.054)	3.975 (.072)	4.255 (.060)	4.314 (.088)	3.799 (.047)
*Feelings of self-worth	3.613 (.052)	3.927 (.051)	4.194 (.058)	4.320 (.051)	4.331 (.081)	3.797 (.045)
*Motivation to contribute best efforts	3.497 (.054)	4.087 (.046)	3.785 (.069)	3.975 (.059)	4.076 (.097)	3.723 (.042)

*These questions are coded on a 5-point scale where, 1 = to a very little extent, 5 = to a very great extent.

with the nature of the work itself and feel a strong sense of self-worth. On the other hand, they register relative dissatisfaction on several important dimensions of their work: status, salary, and promotion opportunities. One might wonder why they seem so positive about the larger issues and so negative about the work mechanics and what impact this might have on motivation and performance.

Herzberg [Herzberg, ref. 41] maintains that some factors such as working conditions, salary, relationships with the supervisor, company policies and benefits, and the job environment or physical conditions are important not so much because they motivate employees to perform but, rather, because their absence causes dissatisfaction and inhibits good performance. These hygiene factors are basic commodities without which motivational interventions have no chance. They are not, however, motivating factors.

In the case of PAs, we find enriched jobs full of motivating factors, but the basic hygiene ingredients are lacking. Therefore, the dissatisfiers are serving to "bog down" PAs and keep them from fully applying themselves to their work. The PA is the least motivated of all paraprofessionals.

Although physicians and corpsmen both show lower motivation, these groups also perceive very low satisfaction with work content. Thus, something is keeping PAs from being motivated to do their best work, and the questionnaire and interview data indicate that this something is the lack of salary and status benefits. The data further point out that while many PAs plan to stay until they have served twenty years, they are remaining mainly because they cannot afford to leave, given the military retirement benefits for twenty-year veterans. They are, in the meantime, disturbed about the lack of hygiene factors to such an extent

that in many cases they have become primarily second-career oriented. Much of their energy is, therefore, being drained away from their work and being spend on anxiety, frustration and withdrawal (or daydreaming about their next position in the civilian world). Placing a ceiling on rank and pay has served to stint full commitment. The PA position is now viewed as a job instead of a career which, by definition, has an unlimited upward ladder.

One of the paradoxes of these data, also reported in the interviews, is that they illustrate strong job dissatisfaction but high career satisfaction. This can be explained in two ways. First, the hygiene factors are viewed as basic blocks to job satisfaction. PAs seem to otherwise like their military-health careers. They are hopeful that eventually these hygiene blocks will be removed and they can become primarily military-career oriented. In the meantime, these hygiene blocks tend to focus PA attention on the job and away from the career--or towards the second career.

Second, even if the military opportunities never materialize, there are numerous career options outside the military. PAs can quite easily draw the distinction between their current jobs and their future careers, in which case the military serves as a vehicle to enhance their real careers. They can easily view themselves in a career transition period. Thus, they are not really dissatisfied in any case but they may lack motivation and commitment to their current positions in the military.

V.C.2.b. The Nurse Practitioner

Nurse Practitioners seem to experience quite a different set of issues around career satisfaction. They report comparative satisfaction on almost every dimension of the position. However, our field data indicate several areas where career issues may impair NP effectiveness.

First, role conflicts exist, as would be expected in new and unclear roles. All organizational members perform their duties in conjunction with relevant others, termed the "role set." The importance of this role set varies depending upon the requirements for interdependence (how much they must all work together to effectively accomplish their goals). When a person acts in a way contrary to the expectations of his role set, conflicts occur.

Some NPs report receiving contradictory and opposing messages from their role set. The Head Nurse says one thing and the supervising physician another. A choice to comply with one group of expectations will prevent the other expectations from being realized. Moreover, being an NP is complicated by the unclear role expectations. What often results is a multiple role consisting of some straight nursing, some NP work and some PA work. Multiple roles include multiple role sets, all of whom have expectations, which compounds the above problem of choosing one request at the expense of another and therby causing conflicts with the neglected party.

Overlaid onto the expectations of the role set are the role definitions held by the NP. While the Air Force seems most clear about the NP's role (a physician extender), the Navy appears most ambivalent. Navy NPs talk about having to sell themselves and their role through complying initially to other's expectations but, eventually, doing what they perceive as their real role. Conflicts often emerge because none of the expectations of the role set seem acceptable to the role persons. Many NPs are in conflict because what others want them to do violates their professional code, is incongruent with their training or is different from their own role expectations and satisfactions.

This leads to the other issue frequently mentioned during the interviews, namely, how can NPs become influential enough as a group to assure a third career track (clinical practice) within the Nursing Corps? Tables 5.18 and 5.19, reproduced here as Table 5.26 for convenience, illustrate the extent to which NPs view themselves as influential and how others see them. NPs generally perceive themselves as more influential than do the other groups who work with them. They are, of course, seen as more influential on medical than administrative matters, for after all they specialize in practice while nurses do more administration. In general NPs are seen as having more medical influence than Nurses or PAs, but not substantially more. They have considerably less influence than physicians (who really occupy the seats of power in medical settings).

Administratively, the NP is less influential than either the physician or the nurse, although he is slightly more influential than the PA. Many of the decisions about the future roles of NPs will be made by administrators within the Bureaus of Medicine, and at that level, the NPs seem relatively uninfluential. Even PAs, who are not full-fledged military officers, have almost as much administrative influence as NPs. Moreover, our data reveal that 84.2% of all Nurse Pracitioners are female in what could easily be seen as a male-dominated (military) doctor-dominated (health care) world.

How NPs within the various services attempt to establish themselves as influential is interesting. The Navy NPs have clearly lined up with the Nursing Corps, hoping to assure a third career option within the Corps. The Air Force NPs have sided with the physicians and have little contact with the local Head Nurse. They hope for a third (para-professional) medical division within the Bureau of Medicine and Surgery. The Army NPs, at

Table 5.26
Perceived Medical and Administrative Power and Influence of Each Role

Responses are coded on a scale of 1 to 5 where, 1 = little or no influence, 5 = a very great deal of influence.

Role of Evaluator	Average (standard error) Medical influence of						
	Self	MD	Nurse	PA	NP	AMOSIST	Corpsman
MD	3.990 (.052)	4.152 (.047)	2.709 (.046)	2.736 (.052)	2.920 (.052)	2.221 (.085)	1.978 (.041)
Nurse	3.550 (.062)	4.521 (.044)	3.440 (.059)	3.078 (.093)	3.383 (.081)	2.372 (.144)	2.350 (.052)
PA	2.917 (.084)	4.326 (.066)	2.344 (.086)	3.173 (.083)	2.693 (.096)	1.820 (.124)	1.815 (.060)
NP	3.067 (.073)	4.397 (.055)	2.438 (.070)	2.674 (.112)	3.440 (.072)	1.907 (.148)	1.966 (.071)
AMOSIST	2.846 (.122)	4.621 (.087)	2.737 (.158)	2.732 (.200)	2.903 (.191)	3.321 (.120)	1.885 (.118)
Corpsman	2.684 (.049)	4.449 (.039)	3.289 (.053)	3.201 (.065)	3.160 (.065)	2.482 (.102)	2.494 (.047)
Overall	3.223 (.028)	4.375 (.021)	2.956 (.027)	2.970 (.032)	3.117 (.030)	2.424 (.050)	2.182 (.023)
Percent of sample answering Do Not Know/ No Opinion	2.3	6.4	17.1	35.6	29.6	68.9	12.4

Role of Evaluator	Average (standard error) Administrative influence of						
	Self	MD	Nurse	PA	NP	AMOSIST	Corpsman
MD	2.938 (.061)	2.761 (.053)	2.476 (.049)	2.017 (.051)	2.272 (.054)	2.111 (.082)	1.823 (.042)
Nurse	3.426 (.068)	3.041 (.066)	3.007 (.065)	2.179 (.089)	2.500 (.086)	2.063 (.132)	1.990 (.051)
PA	1.965 (.073)	2.779 (.086)	2.456 (.094)	2.112 (.073)	1.935 (.075)	1.490 (.113)	1.614 (.058)
NP	2.472 (.076)	3.303 (.081)	2.349 (.073)	2.031 (.096)	2.608 (.076)	1.795 (.151)	1.850 (.071)
AMOSIST	2.239 (.123)	3.469 (.137)	2.378 (.149)	2.018 (.175)	2.186 (.165)	2.606 (.135)	1.610 (.114)
Corpsman	2.483 (.052)	3.011 (.053)	2.800 (.057)	2.408 (.067)	2.505 (.066)	2.384 (.109)	2.107 (.045)
Overall	2.744 (.029)	2.989 (.028)	2.642 (.028)	2.158 (.030)	2.388 (.030)	2.166 (.049)	1.913 (.022)
Percent of sample answering Do Not Know/ No Opinion	2.9	9.2	18.5	37.6	31.9	68.5	13.0

least at the local installation investigated, try to keep both groups (physicians, nurses) happy and hopes for the support of both. Time will tell which services has the best strategy.

V.C.2.c. Conclusions to the Satisfaction Issue

The Physician Assistant is typically male (about 98%), a ten-year or longer veteran planning to remain in the military until he has "done his twenty years," a former medical corpsman, dissatisfied (even angry) about the relative deprivation caused by the rank/pay ceiling, satisfied about the nature of his work, hoping that the military will remove the above rank/pay restraints and encourage him to remain longer, but realistically, planning to gain experience to begin his second career.

The Nurse Practitioner is typically female (84%), 8 years or more service, and while military-career oriented is also mindful of her marketability in the civilian world. She typically plans to stay in the military if the role will evolve to match her expectations and if she can progress in her career without having to become an administrator. While the PA feels demotivated and unable to view the military as deserving of his primary career energy, the NP feels satisfied in the present but uncertain about the future. She is caught in numerous role conflicts as the expectations of various influentials in her role set clash. She is attempting to gain influence within the Nursing Corps and the local health care facility in order to influence her future role. Thus far, she has not succeeded in becoming influential, especially on administrative matters.

V.D. Organizational Commitment

A comprehensive analysis was performed on the factors underlying the commitment of military medical personnel to their command organization.

Complete descriptions of the theory and methodology can be found in Feris and Peters [Ref. 30]. The major features of this analysis are summarized as follows:

V.D. 1. Categorizing the Sample

The major outcomes of organizational commitment are postulated to be productivity, retention, and efficiency. Of the three, the primary focus is on retention. Based upon the suggestion that the best predictor of personnel retention is the employee's own direct estimate of his future tenure [Atchison and Lefferts, ref. 9], the sample was divided according to whether the sum of a subject's present length of service plus the length of time he intended to remain indicated a full military career. For the purpose of this study, a career was defined as 18 years active service, rather than the standard minimum of 20 years, to allow for the possibility of respondents rounding off to the nearest value and for the enlisted personnel policy allowing for the accrual of "constructive" time for early reenlistment. This policy permits retirement before 20 years of service.

Even among those persons committed to a full career, one can distinguish between those who are willing to work towards objectives and those who are merely "putting in time". The sample was divided into high and low groups based on the response to Survey Item 12 of Part III (A), "To what extent do you feel motivated to contribute your best efforts to the command's mission and tasks?" Those who answered, "To a great extent" or "To a very great extent" were defined as highly motivated. These two criteria provided the means for differentiating the respondents into four classifications of commitment; Group I, actively committed; Group II, passively committed; Group III, potentially committed; and Group IV, not committed. Those who

are actively committed are those who feel strong personal motivation to contribute to the tasks and missions of their command who also plan on remaining in the military until at least the twenty-year retirement point. Those who are passively committed intend to remain until retirement, but feel little motivation. The potentially committed are highly motivated but don't intend to stay in the military for a full career, while the uncommitted feel little motivation and intend to leave the military early.

Initially we examined the percent of responses in each of these categories for each branch of the armed services, as well as for each medical role. It was discovered that the percent of career-intended and distribution of high and low motivation responses were fairly uniform by role across the three services. Because of the relative uniformity within the roles across the services, the samples were aggregated for the analysis. The distribution of the cases based on the career and motivation criteria is shown by role in Table 5.27.

Physicians, as expected, are both the least motivated and least committed group. Only 24.2% of the physicians are actively committed, while over 70% plan to leave the service before the twenty-year point. The PAs and NPs both express very high degress of motivation and commitment; nearly 54% of each group falls in the "actively committed" category. Only 26% of the PAs plan to leave the service early, while 35% of the NPs plan on doing so. For comparison, the next most committed role (nurses) has about half the members planning on early severance.

V.D.2. Factors Which Determine Commitment

A number of factors potentially affecting the decision to continue in or withdraw from the military were examined. To allow greater efficiency in examining the relative importance of various organizational, job-related,

Table 5.27
Organizational Commitment by Role

Category	Percent of Responses in Each Category					
	Physician	Nurse Super-visor	Nurse	PA	NP	Corpsman
Active Commitment	24.2%	75.1%	40.7%	53.9%	53.9%	39.7%
Passive Commitment	4.8	12.5	9.9	19.9	10.7	10.7
Potential Commitment	31.0	8.1	29.9	12.9	19.6	26.1
No Commitment	40.0	4.3	19.5	13.3	15.8	23.5
No. of responses in sample	546	209	184	241	291	804

and personal factors, eleven indices were constructed by grouping related items. Each indexed variable was derived by summing the responses to the component items and dividing by the number of components. The following variables were employed in the analyses:

a. Occupational commitment: questions 3 through 7 of Part IV. This scale is compromised of the needs for technical competence, managing, early retirement and second career, job security, and innovation and creativity in the job. Certain of the items required reversing the raw scale prior to aggregation. A high score indicates an orientation toward an outside career.

b. Job satisfaction: Motivators: questions 4, 6, 7, 8, for Part III(E), and question 17 from Part III(A). This index is comprised of varing motivating factors, the work itself, autonomy, progress to date, promotion opportunity, and variable leading to satisfaction, feelings of pride and self-worth. A high score indicates a high level of satisfaction.

c. Job satisfaction: Hygienes: questions 1, 2, 3, 5, from Part III(E). This index is similar to the one above and includes satisfaction with supervision, status, salary, and educational opportunities.

d. Medical formalization: questions 1 a, 2 a, and 3 a, from Part III(B). This index assesses the degree of perceived formalization of medical task management. A low score indicates relative freedom from strict operating procedures and job description specificity.

e. Administrative formalization: questions 1 b, 2 b, and 3 b, from Part III(B). This index is similar to the one above but addresses corresponding administrative task issues.

f. Medical autonomy: questions 4 a, 5 a, 6 a, 7 a, and 8 a, from Part III(B). This index differs from Medical formalization in that the component items here address the perception of the centralization of decision-making. A low score on this index indicates that decisions are usually made at the working level.

g. Administrative autonomy: questions 4 b, 5 b, 6 b, 7 b, and 8 b, from Part III(B). This index corresponds to Medical autonomy.

h. Group performance: questions 1 and 7 from Part III(A). The ability of the work group to maintain high standards of performance and to work well under pressure is reflected in this index.

i. Work communication: questions 8, 10, and 11 from Part III(A). The degree of flow of upward, lateral, and downward communication is measured by this climate index. A high score indicates a very responsive communications network.

j. Group affiliation: questions 2 through 6 from Part III(A). All items in this index relate to the responsiveness and cohesion of the work group in terms of group problem-saving, mutual encouragement and trust, resolution of disagreement, and planning and coordinating. A high score is consistent with high group affiliation.

k. Command organization: questions 9, 13, and 14 from Part III(A). Items relating to the degree of perceived consideration for human resources are included here. A high score is indicative of organizational concern for workload and time factors, organization of work activities, and welfare and morale of its personnel.

Other variables brought into the analysis which were left as discrete entities included:

l. Length of service category. This variable was measured on a six-point ordinal scale created by grouping of the continuous raw data given in years and months. The ordinal categories were : (1) two years or less; (2) more than two through four years; (3) more than four through eight years; (4) more than eight through twelve years; (5) more than twelve through sixteen years; and (6) more than sixteen years. The grouping of the years was selected to conform in general with the minimal active duty service time and with typical reenlistment periods.

m. Overall job satisfaction: question 18 from Part III(A). This summary attitude measure is scaled undimensionally from very dissatisfied (a low score) to very satisfied (a high score).

n. Career-enhancing assignment: question 17 from Part III(A). This variable reflects the degree to which respondents perceive their present assigned work as consistent with their career objectives.

o. Need for independence: question 1 from Part IV. A preference for a career which allows one to work independently as opposed to working with others is measured here. A high score is indicative of a reportedly high need in this dimension.

p. Need for leisure time: question 2, Part IV. This variable relates to an individual's preference for a career in which the work does not interfere with one's family life or the development of outside interests. As with the need for independence, a high score here is indicative of a high need in this dimension.

The indices making up variables (a) through (g) were constructed a priori by grouping items felt to describe specific dimensions. Subsequent tests of each index using Spearman rank-order correlations demonstrated moderate to good intercorrelations of the index components for all variables. Variables

(h) through (k) consisted of items drawn from the Navy Human Resource Management Survey. The indices used here are those developed by Pecorella, Hausser, and Wissler [ref. 62] for use with the Navy survey.

V.D.3. Analytical Results

A stepwise discriminant analysis for each of the six medical roles was performed, with commitment category as the dependent variable and the 16 variables discussed above as independent variables. Results are summarized in Table 5.28. Each role had a different number of variables which entered its analysis and a different relative discriminating strength associated with the variables.

Of the sixteen variables, four consistently entered: Length of Service, Command Organization, Occupational Commitment, and Job Satisfaction (Hygienes). The first two variables were among the three most powerfully discriminating variables for each role. As indicated by the total number of steps before the analysis terminated, at least seven and as many as twelve additional variables entered before the maximum discriminating ability was reached. Only one variable, Group Affiliation, failed to enter into any of the six discriminant analyses.

In addition to the order in which each variable entered the analysis, the mean value of each variable for each commitment category was determined. These data are summarized in Appendix 5.2. For each role, examination of the Length of Service variable reveals a similarity between active and passive commitment, and between potential and no commitment. However, a substantial difference separates the former two categories from the latter pair. Both active and passive committed groups have longer service times. The length of time the respondent had already spent in the service was found to be important, presumably because of both the self-selection of

Table 5.28
Results of Discriminant Analysis

Variable	Stepwise Order of the Variables Entering the Analysis by Role					
	Physician	Nurse Supervisor	Nurse	PA	NP	Corpsman
Length of service	1	1	2	1	2	1
Command organization	2	3	1	2	1	2
Overall job satisfaction	3	2	-	7	-	4
Occupational commitment	4	11	3	4	9	5
Need of independence	5	8	6	-	7	11
Career enhancement	6	-	7	3	6	6
Job satisfaction: Hygienes	7	10	4	5	8	12
Medical autonomy	8	6	-	-	-	14
Work communication	9	-	5	6	10	8
Administrative automony	-	4	-	-	-	7
Administrative formalization	-	5	-	8	4	-
Group performance	-	7	8	9	-	13
Job satisfaction: Motivators	-	9	-	-	3	3
Need for leisure	-	-	9	-	5	9
Medical formalization	-	-	-	-	-	10
Group affiliation	-	-	-	-	-	-
Total number of steps	9	11	9	9	10	14

the career-oriented respondents (those who already have long service times have probably already decided on a career) and the relatively short time remaining until retirement. This last factor was especially important for PAs. In personal interviews most PAs expressed a good deal of hostility toward the military, consistent with the dissatisfaction expressed on the mail survey, but most had a long military career behind them and planned to "stick it out" until retirement. The mean service time for both the actively and passively committed was significantly longer than for the potentially committed and uncommitted groups.

Mean scores for Command Organization show a different dichotomy. In this case, active and potential commitment means are higher than those for passive and no commitment. Thus motivation tends to parallel the perceived degree of command of consideration for human resources. Thus, taken together, the Length of Service and Command Organization variables provide a partitioning of the cases into the four categories of committment which parallels the a priori criteria for committment classification: "expressed intention to continue active service" and "motivation to put forth best efforts to the command's mission."

Occupational Commitment and Job Satisfaction (Hygienes) each consistently serve to isolate the No Commitment category from the other three but do so in a different manner. The No Commitment category scores highest on the Occupational Commitment variable and lowest on Job Satisfaction (Hygienes). The remaining variables entering the discriminant analysis serve to refine the ability to classify the cases by accounting for additional increments of variance.

Further examination of the means on the attitudinal variables demonstrates a general rank ordering, with Active Commitment at the highest

position, followed by Potential Commitment, Passive Commitment, and finally No Commitment. This pattern holds fairly consistently regardless of the medical role. However, notable exceptions are to be found on certain of the variables. The No Commitment category scores highest on Occupational Commitment and Need for Independence. The Passive Committed individuals score highest on Administrative formalization, the measure of the degree of perceived formality in dealing with administrative tasks.

V.D.4. Commitment Group Profiles

These data permit the development of a general profile for each category. To the extent that variables did not enter the analysis of a role, the generalizations may be inappropriate for that specific role.

Active Commitment. Individuals categorized as actively committed had lengths of service similar to the passively committed, but well beyond those of both potentially committed and noncommitted individuals. They perceived a positive concern by their command for consideration of human resources. In all of the job satisfaction measures, actively committed individuals indicated a fair amount of satisfaction and reported their assigned work to be greatly career-enhancing. The performance of the immediate work group and the responsiveness of the communications network were rated high. Both the need for independence and the orientation toward a career outside the military were rated as neutral.

Passive Commitment. The passive committment category perceived little evidence of concern by the command for personnel interests. Individuals viewed their job assignments to be from little to some extent career-enhancing. Overall job satisfaction was rated as neutral to fairly satisfying despite no apparent satisfaction or dissatisfaction on the motivator and hygiene dimensions. Physician assistants provided an exception to this

generalization in that they were dissatisfied with the hygiene factors (status, salary, etc.). The estimation of the effectiveness of work communication was also variable. Nurse practitioners indicated that little information is communicated, in contrast to the remainder of the individuals in this category who were neutral on this work dimension. The performance of the work group was rated high. Like the active commitment category, passively committed individuals remained neutral on the needs for independence and a career outside the military.

Potential Commitment. In spite of indicating a high motivation to contribute their best efforts, individuals in the potential commitment category maintained a neutral position on a number of the dimensions. These included communication, the command's concern for personnel, the need for independence, and the appraisal of assigned work as career-enhancing. Job satisfaction indicators were rated as fairly satisfying for all roles except physicians and physician's assistants who again were neither satisfied nor dissatisfied. On the measures of autonomy, they perceived a reasonable amount of freedom in their jobs, but less than either the active or passive groups. Similarly, their apparent preference for a career outside the military was higher than the active and passive groups.

No Commitment. The group of individuals categorized as having no commitment to the organization took a position tending toward the extreme on most variables. The command was perceived as having little concern for the work and welfare of its personnel, and the communication channels were held to have little effectiveness. The work assignments of members of this group were seen as offering little to very little career enhancement; similar levels of dissatisfaction were reflected in the three job satisfaction dimensions. Commitment in a direction outside the organization was the highest of the four groups. This was accompanied by great needs for work independence and for leisure time.

CHAPTER 6

Summary and Implications

In this chapter the major findings of both the search of the medical literature and of this study are summarized. Then the implications of the findings upon policy issues are discussed. Finally, promising areas for further research are indicated.

I. Summary of Study Results

I.A. Findings of the Review of Medical Literature.

Three types of new health practitioners or paramedics, are covered in this study, nurse practitioners (NPs), physician assistants (PAs), and AMOSISTs. The first two professions are sometimes discussed together in this report, under the general term "mid-level health practioner (MHP). In Chapter 2 a number of issues pertaining to MHP usage, and banners to more extended usage, are discussed. These issues and the general conclusions to be drawn from the literature review are:

1) Economic issues: There seems to be no doubt that MHPs are economically justifiable, at least when legal and professional constraints allow them to practice relatively freely. The AMOSIST role also appears to be economically justified.

2) Quality of care issues: This is an area of enormous concern, particularly in designing paramedically-staffed medical care delivery systems. A good deal of restrictive legislation and custom is justified on the basis of quality issues; thus, the issue is of great practical importance. Unfortunately it is difficult to measure quality objectively, but all subjective judgments of quality reported in literature, as well as those few objective

measurements which have been made, agree that the quality delivered by paraprofessionals is at least as high as that of physicians. As long as the paramedics operate within the limits set by the various studies, quality does not seem to be a problem.

3) Patient acceptance: Patient acceptance is generally very high, particularly since paramedics are used to relieve congestion in many settings. Acceptance depends on such things as professional demeanor of the practitioner, attitudes of the supervising physician, and the clear recognition of gains to the patient from the paramedic (e.g., shorter waiting times, less hurried care). As long as these factors are positive the acceptance is generally excellent.

4) Physician acceptance: Physician acceptance is often a problem in paramedical usage. Even though many physicians fully accept and support the paramedic concept, a number completely reject the idea. Sometimes the rejection is based on concerns about quality of care, legal liability, and so forth; other physicians simply don't like the idea of delegating patient care, for whatever reason. Physician acceptance in military settings is generally much higher than in civilian practice, whether institutional or private.

5) Role definitions: Role definitions for MHPs in particular are reasonably clear in terms of services offered, patients seen and complaints treated. Although the NPs and PAs see themselves as different resources, the two roles are trained to do many of the same tasks, and in the field are occasionally used interchangeably, most notably in the Air Force. What remains to be investigated is the amount of functional differentiation (vs. redundancy)

between PAs and NPs that would optimize efficient effective delivery of health care. The role of the AMOSIST is more clearly defined, but even here the Navy's NAMIC program differs significantly from the Army AMOSIST program in the definition of the precise role to be filled by the NAMIC OR AMOSIST. NAMICs have some discretion in treating patients, and experienced capable NAMICs are observed to resemble closely supervised PAs. AMOSISTs, however, are expected to follow strict protocol without deviation.

6) Training and background: Training programs for both MHP roles differ widely in duration and content. It is unclear just how much training is really needed. For PAs, for example, two models exist, one of which (the MEDEX model) in only half as long as the other (the Physician Assistant/Associate model). In many ways the graduates of each program are equivalent, but no direct comparison of the overall capabilities of the two groups exists. Training programs for NPs also vary widely. There is much more uniformity of training for AMOSISTs and NAMICs, primarily because all AMOSIST training has occurred in one organization and the NAMIC program is a direct adaptation of the AMOSIST model.

7) Legal status: The medical practice legislation enabling MHPs to work varies a good deal from state to state. In general, the specific provisions are ad hoc, and not well rationalized. Many states, for example, specify that a single physician can supervise only a limited number of PAs (usually one or two), yet there is no evidence that this, in reality, is a rational constraint. There are many instances in the armed forces, in certain rural areal health programs, and in some institutions,

where a physician-to-PA or physician-to-NP ratio is much lower, and where the supervising physician may in fact be hundreds of miles distant, seemingly with no degradation in the quality of care. In at least one state (California) enabling legislation is so restrictive as to effectively preclude economic PA usage. In the armed services similar restrictions have been placed on MHP usage, again with no justifying data. In fact, in our field observations we noted that some regulations limiting PA usage are ignored or subverted with the knowledge and consent of all concerned, even in the presence of a strong concern for patient welfare. This indicates that some restrictive regulations may be unnecessary for the efficient delivery of good care. In the case of the AMOSISTs, it is again unclear what restrictions should apply, as the Army and Navy models differ significantly in this regard.

8) Political problems: Most MHP training programs are federally supported and are thus subject to various political pressures. They can be cut off at any time. In the armed forces most PA training has ceased as of the summer of 1976, primarily because of the uncertainties in role definition, staffing needs, and procurement procedures.

9) Military specific issues: There are a number of issues concerning career patterns and military rank for MHPs, particularly for PAs, which currently cause a good deal of anxiety and possibly limit MHP effectiveness.

Review of these general conclusions indicates that the technical justification for paramedical roles exists; economic issues, quality issues,

and patient acceptance appear favorable. The problem areas exist in people and organizational interfaces: physician acceptance, role definitions, optimal design of training programs, legal or regulatory restrictions, political pressures, and rank and career issues (in the military). This study, then, was designed to focus on these interfaces.

I.B. Study Design and Findings

As outlined and discussed in the Executive Summary, there are four major management objectives addressed in this study:

1. What is the cost-effectiveness of paramedical programs?
2) Do paramedics deliver adequate quality care? In more general terms, how are the recipients of care affected by paramedics, and do they accept the concept?
3. What roles should each part of the medical team play, and what is the best mix of traditional and new medical practitioners?
4. What organizational problems do the new roles cause? How should administrative policies be designed so as to overcome or minimize these problems?

Some of these issues are partially resolved by the literature survey, summarized above. Others were addressed in the research and analysis phases of the project. Since the methodology and results are summarized at length in the Executive Summary chapter of this report, they will not be repeated here. The reader is referred to that Summary should an outline of the findings be desirable at this point.

II. Management Implications

These findings have a direct bearing on the management questions outlined above. These areas and possibly policy implications are outlined

below. It is not the intent of this study to arrive at definite policy statements, but rather to highlight possible implications of the study results.

II.A. Issue 1: What is the Cost-Effectiveness of Paramedical Programs?

Although we did not examine costs in this project, the literature indicates almost unanimous agreement that NPs and PAs can lower overall costs in large group practice settings. There has been little comparable work on costs of providers at the AMOSIST/NAMIC level.

The measures of effectiveness that we examined all indicated effective usage of the paramedical roles. There is a role segregation of PAs and NPs in terms of practice settings, tasks performed, and patients served, and the de facto roles thus defined are what one would expect, given the backgrounds and specialized training of these providers. A possible exception should be made for NPs, who feel that they are forced into delivering "procedure-oriented," rather than "patient-oriented" care. A more specific complaint is that they are required to see too many patients. Virtually all the AMOSISTs and NAMICs were working in the role for which they were intended.

Satisfaction measures for paramedics were much higher than for physicians, whom the paramedics partially replace. The PAs are dissatisfied primarily with salary, rank, status, and educational opportunities, but are quite happy with the content of their work. The NPs are very satisfied with all aspects of their work, while the physicians are relatively dissatisfied with virtually everything. These data indicate that quality work done by NP-and PA-staffed clinics is apt to be better and the harmony better than in groups where physicians do the bulk of the work. Overall satisfaction of the PAs could undoubtedly be improved even further through changes in career development opportunities, such as continuing education programs, perhaps even leading to physician training in some cases, by

offering higher rank or more pay, or by opening doors to further advancement in other ways. Alternately it may be effective to keep these factors as they are at present and count on procuring PAs with relatively long military careers behind them so that they will remain for the twenty-year retirement point regardless of their dissatisfaction. Determination of the most cost effective strategy would require further study.

II.B. Issue 2: Do Paramedics Deliver Adequate Quality Care?

Literature studies indicate that the quality of care delivered by paramedics is at least adequate. Our findings confirm this in that no specific problem areas are found. When one examines specific tasks being performed, it can be seen that both PAs and NPs can and do perform all important tasks. Thus the de facto role differences appear to be in utilization, not necessarily in capabilities. There appear to be no obvious mismatches between training and task performance, but it is not clear whether the training programs are as efficient as possible. All that can be said is that they adequately cover training for the actual tasks performed. In no case was a role found to be frequently performing a task for which it was judged unsuited.

Paramedics are more confident in the adequacy of their own training than either corpsmen or nurses. A potential problem lies in the extreme confidence of PAs in their own competence, higher even than physicians. Further, the PAs see themselves as being more autonomous than any other group does. Clearly, the provision that the PA work under the direct supervision of a physician does not always work in practice. There is no evidence that this autonomy has led to practical problems, however, and it is possible that the practical autonomy of PAs is a result of their actual

competence. Additional investigation of the quality of PA delivered care should be undertaken, however, in order to protect against potential abuses or, if quality is found to be adequate, to recognize formally the PAs autonomy as appropriate.

II.C. Issue 3: What are the Optimal Role Definitions and Mix of Providers?

Although formal roles are poorly defined for both PAs and NPs, fairly consistent de facto roles have evolved in the armed forces. In essence, NPs usually focus on dependent care of all types, particularly in OB/GYN and pediatrics, while PAs are used primarily for acute care to all types of patients. Each role, including traditional roles and AMOSIST/NAMICs as well as NPs and PAs, performs a relatively consistent mix of medical tasks and, although specific tasks are performed by many roles, the mixes are unique for each role. Both PAs and NPs were viewed as valuable and influential (in medical matters) by those familiar with them.

Since it appears that there are distinct and presumably valuable functions performed by each of the MHP roles, it may not be prudent to expect a single MHP role (e.g. PAs) to provide the full range of intermediate medical services. While it may be possible to train and motivate a generalist MHP role (PAs or NPs) to perform a wide variety of tasks, the costs of training and supporting a pool of such generalists would probably be higher than a stratified pool that was matched to the particular mix of patients and needs of individual medical locations. In addition, there would be greater inefficiencies and misallocation of resources where more expensive MHPs are providing services that could be as effectively offered by less costly personnel (NAMICs and AMOSISTs).

Although over-specialization and maldistribution problems are evident in the utilization of physicians, it may not be appropriate to infer analogous objections regarding utilization of MHPs. One important difference in these two instances is that the fixed and continuing costs of using specialists and general physicians in the military are roughly equal, whereas there are significant cost differentials associated with training and maintaining PAs, NPs, and AMOSISTs. Another important difference is that specialization among physicians is motivated by fee-for-service which attracts physicians to the more lucrative (costly procedures) specialities away from general medicine where most of demand is. However, in the military with no fee for service, there is no comparable incentive for MHPs to migrate to specialties which may be under-utilized. In addition, the individual services can centrally control the allocation and specialization of MHPs whereas civilian physicians determine their own utilization.

Thus, matching the diverse variety of medical demands in the military with a comparably differentiated force of health care providers may generate substantial economies of service without compromising the quality of care. Indeed there are indications quality may even improve when specific treatments are provided by appropriate MHPs (e.g. NPs in pre-natal care). The de facto roles defined in this study could serve as a basis for a revised formal role description and used for training and staffing decisions. The NP role, for example, could be defined as providing primarily dependent-related care with a heavy emphasis on specialty training (OB/GYN, pediatrics) and only a secondary role in ambulatory care to other types of patients. However, further study is required before these inferences can be accepted as conculsive.

II.D. Issue 4: What Organizational Problems do the New Roles Cause?

Measures of satisfaction showed that physicians are the least satisfied of all groups, and that for physicians the military seems to offer little in the way of professional or monetary rewards. Both PAs and NPs are more satisfied than physicians, the NPs much more so, so substitution of these roles for physicians should decrease satisfaction-related problems, in addition to leading to cost savings. Further, the extensive use of PAs and NPs in primary care may improve physician satisfaction by relieving the physician of the bulk of routine care, leaving him with a more challenging and satisfying assignment.

If the usage of new practitioners is expanded or continued, friction between the nursing role and the newer roles, particularly PAs, can be expected. Some evidences of strain were noted in the field interviews, and the disparity between administrative and medical influence and between self-perceived and other-perceived influence for nurses documents this problem. Problems also exist between nurses and NPs, revolving around both career planning issues and relative authority issues.

Conflicts between internal goals (technical competence, autonomy, security, creativity, viable career path) and oranizational goals show up in the examination of motivations and rewards. However, the issue of how to retain personnel in their jobs, whether it is military health care or an automobile assembly line, is complex. To some degree, the study has pointed out the scope of the problem by identifying certain seemingly unrelated elements which effectively differentiated between individuals intending to remain in military health care and others who elect to leave it.

The partitioning of the study sample into categories of organization commitment appears to be a worthwhile technique for several reasons.

Paramount is the fact that it can more clearly focus the problem of personnel losses upon those highly motivated individuals who leave active service and who thus represent significant opportunity losses to the health care system. This recognition may serve as one means of sharpening retention efforts. Additionally, the identification of individuals who remain in active service but who indicate little motivation for exerting their maximum efforts on behalf of the system draws attention to areas which organizations can explore to make more efficient use of costly human resources. This procedure also permits a close examination of the organization factors which are and are not related to personnel losses. The surprisingly strong effect that command concern for individuals, or lack thereof, plays in retention suggests that in many cases commands may be failing to provide the leadership necessary to develop a sense of loyalty and dedication among health care personnel. A lack of attention to the personal needs and expectations of all individuals making up the health care team can only worsen any turnover problem. While a perceived concern of the command for the welfare of its personnel may not stem the flow of those choosing to leave, the short-term interests of the command, its personnel, and the outpatient population served can only benefit from an upswing in motivation among the staff.

Further studies could enlarge upon these findings by controlling for such dimensions as the size of the command, span of control, work setting, and other structural components, as well as providing for a more representative sampling distribution. Studies with a longitudinal capability would allow for the measurement of dynamic interplay of the variables in the model as individuals and organizations interact over time. The effect of ascending in rank and the correlates of this process, such as increased responsibility, change in perspective of the organization, and increased pay and allowances,

would be measurable in a study design of a longitudinal nature.

An interesting aspect of the findings on careers is the extent to which the military health care system allows highly skilled and costly personnel to use it as a training ground for another career. This is not so much the fault of the personnel (especially, PAs) who appear to be responding normally and naturally to the lack of career options before them, as it is due to the proscribed career paths available in the military. From the individual perspective, the very idea of a career is the matching of personal needs and skills to work, allowing a person to change and grow over some period of time. However, in the military one may feel more limited in terms of career choices because of the high penalties of leaving the service and foregoing early retirement. In many enterprises, one feels free to change jobs, companies or careers because retirement can be negotiated upon entering the next place of employment, and because at mid-career retirement is still a long way off. Thus, it must be frustrating for PAs to realize that an outside market exists for their skills today but that retirement is not a viable option for another five or ten years, when the opportunities may not exist. It must be demotivating to see the opportunities elsewhere for both interesting work and incremental satisfaction from hygiene factors, but still feel tied to job security. One can at least increase the satisfaction of PAs on hygiene factors by giving bonus pay, allowing at least Warrant Officer status in all services and provided additional training/educational experiences.

Nurse Practitioners are engaged in the normal and natural struggle of any new group launching a new career pattern. These problems also appear analagous to those of NPs in the civilian sector of society. The critical problem seems to be gaining acceptance for the new role, clarifying it, and

developing a career path, with options, within the military health care setting. NPs would probably be more likely to perform effectively if they could be assured that practicing medicine was a legitimate career option, if their roles were clarified, giving them more autonomy, and if they were better represented (had more influence) within the Nursing Corps.

III. Further Studies

This research project revealed that paramedical programs, specifically programs involving the PA, the NP, and the AMOSIST skill levels, show a great deal of promise in substituting lower cost for high cost personnel resources, alleviating a manpower shortage in the GMO area, increasing provider satisfaction by better matching the skill level of the provider with the work to be done, and increasing patient satisfaction. Although our primary purpose was not to measure the degree to which these benefits were realized in the field, we certainly got the impression that each of the programs was viable and was successful in accomplishing these objectives. If any of these new roles is to be integrated into the military heath care system, however, a number of long range problems must be overcome. Among these problem areas are:

A. Measurement and Control of Quality of Care

Lack of a good method of quality measurement severely hampers any innovative health management program, including paramedical programs. Systems involving paramedics must be extremely conservatively designed in order to forestall any criticism of quality.

B. Role Definition and Differentiation

Better work in this area is necessary to clarify expectations, rationalize manpower planning, rationalize training programs, and clarify career progression patterns.

C. Motivations and Reward Structures

Such factors as the opportunity to increase professional competence and autonomy, continuing education, professional status, and degree of interaction with medical peers may be just as important as pay. Many of these factors are not being considered in systems design.

D. Procurement Issues

Some trading programs may not need to be as long as they currently are. Selection criteria for some programs may be inappropriate, given the current structure of the program.

Appendix 4.1

Questionnaires 1 (Q1)

For Military Health Care Providers

NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA - 93940

IN REPLY REFER TO
NC4(55Gi)/kld
27 January 1976

To: Questionnaire Recipient

This questionnaire is part of a Department of Defense study on effective utilization of all members of health care teams in the armed forces. Currently many types of professionals and paraprofessionals are engaged in health care, and we wish to identify the problems associated with fully utilizing the abilities and training of each person. We are not evaluating the relative worth of each profession, but rather determining what problems exist in using each profession most effectively. This study is integral to an overall effort to improve the quality of health care in the military with the limited resources available. Thus we would deeply appreciate your cooperation in completing the questionnaire. The study has the endorsement and cooperation of the Surgeon General of the Army, the Surgeon General of the Navy, and the Surgeon General of the Air Force as well as the office of the Secretary of Defense (M&RA).

Specific instructions on completing the questionnaire can be found on the inside cover. Note that we ask three basic kinds of questions: questions regarding your time allocation and specific tasks you may do, questions regarding your work setting and career plans, and some demographic questions (age, sex, etc.). We hope to differentiate the various medical roles in the military to identify some potential barriers to increased organizational effectiveness. The questionnaires are completely confidential, so please be completely honest in your responses. The individual identity of respondents will not be recorded. The identification number on each questionnaire enables us simply to identify your installation and for purposes of data analysis. We would appreciate your prompt completion of the questionnaire, at least within the next week if possible.

Thank you very much for your help.

Instructions

The questionnaire is self-explanatory. Simply follow the instructions carefully. If there is any difficulty in interpreting questions, try to give the most reasonable answer possible. When you're through, put the entire questionnaire in the accompanying envelope and mail. It will probably take about 20-25 minutes to complete the questionnaire.

All responses will be kept strictly confidential. There is not record of which individuals participate in the study. Complete frankness will greatly enhance the value of the study.

Part I: Medical Role Description

For each of the following questions, please check the box or fill in the appropriate information which most accurately indicates your answer to the question.

1. What is your present primary role in the military health care system? (Please check only one box.)

- ☐ 1. Physician
- ☐ 2. Nursing Supervisor
- ☐ 3. Nurse
- ☐ 4. Physician Assistant
- ☐ 5. Nurse Practitioner/Nurse Clinician
- ☐ 6. NAMIC/AMOSIST
- ☐ 7. Corpsman
- ☐ 8. Other (specify) _____

2. How long have you been in your present position/role? _____years _____months (7-8) (9-10)
(For example: how long have you been a P.A.?)

3. Where are you currently working on this base? _____
(e.g., Emergency Room, OB-Gyn Clinic, Ambulatory Clinic, Dispensary, etc.)

4. In what medical specialty have you been trained? (Please check only one box).

- ☐ 1. OB-Gyn
- ☐ 2. Family Practice
- ☐ 3. Pediatrics
- ☐ 4. Surgery
- ☐ 5. Internal Medicine
- ☐ 6. Psychiatric
- ☐ 7. Chronic Illness
- ☐ 8. I have no medical specialty
- ☐ 9. Other (specify) _____

13 5. Does your present job involve you in providing direct medical care to patients?

☐ 1. No (if no, skip to Part II on page 3)

☐ 2. Yes (if yes, please answer the following questions)

14-16 6. What is the total number of patients you see on an average work shift? _____

17-19 7. What percentage of your time is spent in face-to-face contact with patients? ___

8. In your present job, how much of your time is spent providing treatment to <u>each</u> of the following types of patients?

	All of my time (95%-100%)	Not all, but a great deal (61%-94%)	A moderate amount of time (21%-60%)	A small, but significant amount of time (11%-20%)	Little or none of my time (0-10%)
a. Active-duty personnel	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Military dependents	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Retired military personnel	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. Others (specify)_____	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

9. In your present job, how much of your time is spent dealing with the patients with each of the following medical needs?

	All of my time (95%-100%)	Not all, but a great deal (61%-94%)	A moderate amount of time (21%-60%)	A small, but significant amount of time (11%-20%)	Little or none of my time (0-10%)
a. Acute illness/injury	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Chronic illness	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Routine checkups	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Part II: Medical Task Responsibilities

The following are 50 medical tasks which might be performed in an ambulatory care setting. We are interested in knowing which of these tasks you actually do perform in your role as a provider of medical care. For each task, indicate how often or frequently you perform that task in your present job.

Note : Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Almost Never Perform	Infrequently/ Seldom Perform	Sometimes Perform	Frequently Perform	Quite Frequently Perform	
1. Measure and record height,weight, and blood pressure.	1	2	3	4	5	27
2. Record the results of laboratory studies.	1	2	3	4	5	28
3. Take and record complete medical history.	1	2	3	4	5	29
4. Take ECG.	1	2	3	4	5	30
5. Distinguish between normal and abnormal ECG.	1	2	3	4	5	31
6. Take throat cultures.	1	2	3	4	5	32
7. Evaluate and treat Strep throat according to protocal.	1	2	3	4	5	33
8. Perform complete general physical examination for new patients.	1	2	3	4	5	34
9. Perform physical examination with physician confirming heart & lung findings.	1	2	3	4	5	35
10. Collect venous blood samples.	1	2	3	4	5	36
11. Start intra venous fluids.	1	2	3	4	5	37
12. Collect clean catch urine.	1	2	3	4	5	38

	Almost Never Perform	Infrequently /Seldom Perform	Sometimes Perform	Frequently Perform	Quite Frequently Perform	
13. Change foley catheters in male patients.	1	2	3	4	5	39
14. Provide routine prenatal care.	1	2	3	4	5	40
15. Counsel patients on family planning.	1	2	3	4	5	41
16. Measure & record fetal heartbeat.	1	2	3	4	5	42
17. Palpate uterus for fetal position.	1	2	3	4	5	43
18. Pelvic exam for Cervical Dilatation.	1	2	3	4	5	44
19. Deliver baby following uncomplicated pregnancy.	1	2	3	4	5	45
20. Take pap smears.	1	2	3	4	5	46
21. Perform routine pelvic exams.	1	2	3	4	5	47
22. Teach breast self-examination to patients.	1	2	3	4	5	48
23. Perform cardio pulmonary resuscitation.	1	2	3	4	5	49
24. Percuss bladder for distension	1	2	3	4	5	50
25. Evaluate & treat diarrhea.	1	2	3	4	5	51
26. Evaluate & treat abdominal pain according to protocols.	1	2	3	4	5	52
27. Evaluate & treat chest pain according to protocols.	1	2	3	4	5	53
28. Perform rectal exam to evaluate prostate gland.	1	2	3	4	5	54
29. Perform sigmoidoscopy.	1	2	3	4	5	55
30. Evaluate & treat V.D. by protocol.	1	2	3	4	5	56
31. Manage patients with chronic disorders according to standing protocols.	1	2	3	4	5	57
32. Prescribe diabetic diets & adjust insulin dosage.	1	2	3	4	5	58
33. Adjust medication for patient with hypertension according to protocol.	1	2	3	4	5	59
34. Counsel patients with minor emotional disturbances.	1	2	3	4	5	60

	Almost Never Perform	Infrequently / Seldom Perform	Sometimes Perform	Frequently Perform	Quite Frequently Perform	
35. Diagnose & treat acute otitis media.	1	2	3	4	5	61
36. Diagnose & initiate treatment for otitis externa.	1	2	3	4	5	62
37. Examine ears with otoscope.	1	2	3	4	5	63
38. Dilate pupils.	1	2	3	4	5	64
39. Examine retina and optic discs.	1	2	3	4	5	65
40. Perform test of intra ocular pressure (tonometry).	1	2	3	4	5	66
41. Removal of foreign body from eye.	1	2	3	4	5	67
42. Perform visual acuity.	1	2	3	4	5	68
43. Suture a laceration.	1	2	3	4	5	69
44. Remove suture.	1	2	3	4	5	70
45. Incise & drain abscess.	1	2	3	4	5	71
46. Strap or tape ankle, wrist, or knee for immobilization.	1	2	3	4	5	72
47. Set an undisplaced fracture.	1	2	3	4	5	73
48. Set a displaced fracture.	1	2	3	4	5	74
49. Reduction of shoulder dislocation.	1	2	3	4	5	75
50. Aspirate joint fluid from knee.	1	2	3	4	5	76

			1
77	78	79	80

Part III: Work-related Attitudes and Descriptions

Part III (A)

The following questions seek to get your responses concerning several aspects of how you feel about the place in which you work and the people with whom you work. The first 7 questions ask about "people in your work group." By work group we mean people with whom you come into contact regularly concerning your day-to-day work activities. Please answer all questions in this section.

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent
1. To what extent do people in your work group maintain high standards of performance?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
2. How much do people in your work group encourage each other to give their best effort?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
3. To what extent do members of your work group offer each other help in solving job-related problems?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
4. To what extent do members of your work group take the responsibility for resolving disagreement and working out acceptable solutions?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
5. To what extent do you have confidence and trust in the members of your work group?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
6. To what extent do members of your work group provide the help you need so you can plan, organize, and schedule work ahead of time?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
7. In general, to what extent do members of your work group perform well under pressure or in emergency situations?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
8. To what extent are you told what you need to know to do your job in the best possible way?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent	
9. To what extent do you feel that workload and time factors are adequately considered in planning your work group assignments?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	14
10. To what extent are those above you receptive to your ideas and suggestions?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	15
11. To what extent is the amount of information you get about what is going on in other departments adequate to meet your needs?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	16
12. To what extent do you feel motivated to contribute your best efforts to the command's mission and tasks?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	17
13. To what extent are work activities sensibly organized in this command?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	18
14. To what extent does this command have a real interest in the welfare and morale of assigned personnel?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	19
15. To what extent do you regard your present position of duties in this organization as enhancing your career?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	20
16. To what extent do you feel you have been adequately trained to perform your assigned tasks?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	21
17. To what extent does your assigned work give you pride and feelings of self-worth?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	22

	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Fairly Satisfied	Very Satisfied	
18. All in all, how satisfied are you with your present job (overall satisfaction)?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	23

Part III (B)

The following questions concern your views on how things are done around here, especially rules and procedures. Please indicate to what extent are each of the following statements true or false in this facility.

Note : Read these answer choices over carefully. Then for each statement, place an X in the numbered box under the answer which most accurately expresses your reaction to the statement.

	Definitely false	More false than true	More true than false	Definitely true
1. Whatever situation arises, we have procedures to follow in dealing with it.				
a. concerning medical tasks	☐ 1	☐ 2	☐ 3	☐ 4
b. concerning administrative tasks	☐ 1	☐ 2	☐ 3	☐ 4
2. Going through the proper channel is constantly stressed.				
a. concerning medical tasks	☐ 1	☐ 2	☐ 3	☐ 4
b. concerning administrative tasks	☐ 1	☐ 2	☐ 3	☐ 4
3. We are to follow strict operating procedures at all times.				
a. concerning medical tasks	☐ 1	☐ 2	☐ 3	☐ 4
b. concerning administrative tasks	☐ 1	☐ 2	☐ 3	☐ 4
4. There can be little action taken here until a supervisor approves a decision.				
a. concerning medical tasks	☐ 1	☐ 2	☐ 3	☐ 4
b. concerning administrative tasks	☐ 1	☐ 2	☐ 3	☐ 4
5. A person who wants to make his/her own decisions would be quickly discouraged here.				
a. concerning medical tasks	☐ 1	☐ 2	☐ 3	☐ 4
b. concerning administrative tasks	☐ 1	☐ 2	☐ 3	☐ 4
6. Generally, even small matters have to be referred to someone higher up for a final answer.				
a. concerning medical tasks	☐ 1	☐ 2	☐ 3	☐ 4
b. concerning administrative tasks	☐ 1	☐ 2	☐ 3	☐ 4

	Definitely false	More false than true	More true than false	Definitely true	
7. Generally, I have to ask my supervisor before I do almost anything.					
a. concerning medical tasks	1	2	3	4	36
b. concerning administrative tasks	1	2	3	4	37
8. Generally, any decision I make has to have my supervisor's approval.					
a. concerning medical tasks	1	2	3	4	38
b. concerning administrative tasks	1	2	3	4	39

Part III (C)

The following questions are concerned with your views of how power and influence is distributed amongst the different groups who work in this facility.

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Little or no influence	Some	Quite a bit	A great deal	A very great deal of influence	Do not know/ not applicable	
1. In general, how much say or influence do you personally have on what goes on in your unit?							
a. concerning medical tasks	1	2	3	4	5	6	40
b. concerning administrative tasks	1	2	3	4	5	6	41

In general, how much say or influence does each of the following people or groups of people have on what goes on in your unit? If any group is not present in your unit or is unfamiliar to you, check box number 6, marked, "Do not know/not applicable."

2. Physicians							
a. concerning medical tasks	1	2	3	4	5	6	42
b. concerning administrative tasks	1	2	3	4	5	6	43

	Little or no influence	Some	Quite a bit	A great deal	A very great deal of influence	Do not know/
3. Nursing Supervisors						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . . .	1	2	3	4	5	6
4. Nurses						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6
5. Nurse Practitioners/Nurse Clinicians						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6
6. Physician Assistants						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6
7. NAMICs/AMOSISTS						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6
8. Chief Corpsmen/Senior Corpsmen						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6
9. Corpsmen						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6
10. Administrators (MSC)						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6
11. Others (specify)						
a. concerning medical tasks	1	2	3	4	5	6
b. concerning administrative tasks . .	1	2	3	4	5	6

Part III (D)

Below are listed a number of types of health-care personnel who might work in an ambulatory care facility. Please indicate how valuable you feel each role's contribution is to the mission of providing quality medical care to this facility's patients. For any role listed which you feel you do not have sufficient information to form an opinion, check the box marked, "Do not know/no opinion."

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Very valuable/ perform essential tasks	Valuable/ essential in some cases	Helpful but seldom perform essential tasks	Of secondary value/ sometimes helpful	Definitely not needed	Do not know/ no opinion	
a. Physicians	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	62
b. Nurses	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	63
c. Chronic Illness Nurses/ Extended Nurses	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	64
d. Nurse Practitioners/Nurse Clinicians	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	65
e. Physician Assistants	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	66
f. NAMICs/AMOSISTS	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	67
g. Corpsmen	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	68

Part III (E)

The following questions ask about your satisfaction with various aspects of your job and military career.

Note : Read these answer choices over carefully.

Then for each statement, place an X in the numbered box under the answer which most accurately expresses your reaction to the statement.

	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor dissatisfied	Fairly Satisfied	Very Satisfied
1. All in all, how satisfied are you with your supervisor(s) in your present job?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
2, All in all, how satisfied are you with present level of status your job has?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
3. All in all, how satisfied are you with your salary in your present job?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
4. All in all, how satisfied are you with the work itself which your present job involves?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
5. All in all, how satisfied are you with the educational/training opportunities available in your present job?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
6. All in all, how satisfied are you with the amount of autonomy/independence you have in your present job?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
7. All in all, how satisfied are you with the progress you have made in the military up to now?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
8. How satisfied do you feel with your chances for getting ahead in the military in the future?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

			2
77	78	79	80

Part IV Career Orientation

The following seven questions ask about your major career values.

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent	
1. To what extent do you prefer a career which allows you to work independently (as opposed to working with others)?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	6
2. To what extent do you prefer a career which allows you time for outside-the-organization activities (eg, for family, for self)?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	7
3. To what extent do you want to become technically outstanding in your field?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	8
4. To what extent do you prefer a career which provides opportunities to become an administrator/manager?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	9
5. To what extent do you prefer a career which provides early retirement and allows you to establish a second career?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	10
6. To what extent are you concerned with job security?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	11
7. To what extent do you require a career in which you can be creative and innovative?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	12

Part V: Personal Information

The following few questions are concerned with personal data and information about your military career.

13-14 1. What is your age? _____ years

15 2. What is your sex?

☐ 1. Female ☐ 2. Male

16 3. What is your present military rank?

☐ 1. E1 - E3 ☐ 5. O1 - O3

☐ 2. E4 - E6 ☐ 6. O4 - O6

☐ 3. E7 - E9 ☐ 7. O7 - O9

☐ 4. W1 - W4

17-20 4. How long have you been in the military?

_____ years (17-18) _____ months (19-20)

21 5. Which branch of the military are you in?

☐ 1. Army ☐ 5. Coast Guard

☐ 2. Navy ☐ 6. Non-Military, Civilian

☐ 3. Air Force ☐ 7. Other (specify) _____

☐ 4. Marines

22-25 6. How long have you worked in military health services?

_____ years (22-23) _____ months (24-25)

26-27 7. Right now, how much longer do you expect to stay in the military?

_____ years (26-27)

		3
78	79	80

Appendix 4.2

Questionnaires 2 (Q2)

For Trainers of Military Physician Extenders

Part I: Medical Role Description

For each of the following questions, please check the box or fill in the appropriate information which most accurately indicates your answer to the question.

1. What is your own medical training?
(Please check only one box)

- ☐ 1. Physician
- ☐ 2. Specialty Nurse (Midwife, Chronic Illness Nurse, etc.)
- ☐ 3. Nurse
- ☐ 4. Physician Assistant
- ☐ 5. Nurse Practitioner/Nurse Clinician
- ☐ 6. NAMIC/AMOSIST
- ☐ 7. Corpsman
- ☐ 8. Medical or Nursing Aid/Technician
- ☐ 9. Other (specify) _____

2. How long have you been in the role specified in question one? _____ years (7-8) _____ months (9-10)
(For example: how long have you been a P.A.?)

3. What is your primary current role in medical professional or paraprofessional training (check only one box)?

- ☐ 1. Course or curriculum design
- ☐ 2. Administration of training or educational programs.
- ☐ 3. Didactic (i.e., classroom or laboratory) teaching of students.
- ☐ 4. Preceptorship teaching of students
- ☐ 5. Both didactic and preceptorship teaching.
- ☐ 6. Student supervision, evaluation, and/or counselling.
- ☐ 7. Student
- ☐ 8. Other (specify)_____

4. How long have you been in the role described in question 3? _____ years (12-13) _____ months (14-15)

16-18 5. What percentage of your time in your job is spent in training and training related activities? _____ %

19 6. What medical role will be filled by the graduates of the program you are associated with?

If you are associated with multiple programs, please select only one program, indicate that program by checking the appropriate box below, then answer the remainder of the questionnaire for that one program only.

- ☐ 1. Physician
- ☐ 2. Specialty Nurse (Midwife, Chronic Illness Nurse, etc.)
- ☐ 3. Nurse
- ☐ 4. Physician Assistant
- ☐ 5. Nurse Practitioner/Nurse Clinician
- ☐ 6. NAMIC/AMOSIST
- ☐ 7. Corpsman
- ☐ 8. Medical or Nursing Aid/Technician
- ☐ 9. Other (specify) _____

Part II

The following are 50 medical tasks which might be performed in an ambulatory care setting. We are interested in knowing which of these tasks the students/trainees whom you train will be capable of performing upon completion of training. Please indicate the extent to which and conditions under which you feel your trainees are capable of handling each task upon completion of their training.

It is, of course, possible that individual trainees vary in their ability to perform some of these tasks. In going through the list, then, please try to indicate the minimum level of competence required to complete the training program.

Note : Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Can perform quite adequately with little or no direct supervision	Can perform quite adequately with some direct supervision	Can perform quite adequately but close supervision is required.	Cannot perform. Task requirements are beyond training.	
1. Measure and record height, weight, and blood pressure.	[ ] 1	[ ] 2	[ ] 3	[ ] 4	29
2. Record the results of laboratory studies.	[ ] 1	[ ] 2	[ ] 3	[ ] 4	30
3. Take and record complete medical history.	[ ] 1	[ ] 2	[ ] 3	[ ] 4	31
4. Take ECG.	[ ] 1	[ ] 2	[ ] 3	[ ] 4	32
5. Distinguish between normal and abnormal ECG.	[ ] 1	[ ] 2	[ ] 3	[ ] 4	33

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Can perform quite adequately with little or no direct supervision	Can perform quite adequately with some direct supervision.	Can perform quite adequately, but close supervision is required.	Cannot perform. Task requirements are beyond training.	
6. Take throat cultures.	1	2	3	4	3
7. Evaluate and treat Strep throat, according to protocal if appropriate	1	2	3	4	3
8. Perform complete general physical examination for new patients.	1	2	3	4	3
9. Perform physical examination, with physician confirming heart & lung findings if appropriate	1	2	3	4	3
10. Collect venous blood samples.	1	2	3	4	3
11. Start intravenous fluids.	1	2	3	4	3
12. Collect clean catch urine.	1	2	3	4	4
13. Change foley catheters in male patients.	1	2	3	4	4
14. Provide routine prenatal care.	1	2	3	4	4
15. Counsel patients on family planning.	1	2	3	4	4
16. Measure & record fetal heartbeat.	1	2	3	4	4
17. Palpate uterus for fetal position.	1	2	3	4	4
18. Pelvic exam for Cervical Dilatation.	1	2	3	4	4
19. Deliver baby following uncomplicated pregnancy.	1	2	3	4	4
20. Take pap smears.	1	2	3	4	4
21. Perform routine pelvic exams.	1	2	3	4	4
22. Teach breast self-examination to patients.	1	2	3	4	5
23. Perform cardio pulmonary resuscitation.	1	2	3	4	5
24. Percuss bladder for distension.	1	2	3	4	5
25. Evaluate & treat diarrhea.	1	2	3	4	5

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Can perform quite adequately with little or no direct supervision.	Can perform quite adequately with some direct supervision.	Can perform quite adequately but close supervision is required.	Cannot perform. Task requirements are beyond training.	
26. Evaluate & treat abdominal pain, according to protocols if appropriate.	☐ 1	☐ 2	☐ 3	☐ 4	54
27. Evaluate & treat chest pain, according to protocols if appropriate.	☐ 1	☐ 2	☐ 3	☐ 4	55
28. Perform rectal exam to evaluate prostate gland.	☐ 1	☐ 2	☐ 3	☐ 4	56
29. Perform sigmoidoscopy.	☐ 1	☐ 2	☐ 3	☐ 4	57
30. Evaluate & treat V.D., by protocol if appropriate.	☐ 1	☐ 2	☐ 3	☐ 4	58
31. Manage patients with chronic disorders, according to standing protocols if appropriate.	☐ 1	☐ 2	☐ 3	☐ 4	59
32. Prescribe diabetic diets & adjust insulin dosage.	☐ 1	☐ 2	☐ 3	☐ 4	60
33. Adjust medication for patient with hypertension, according to protocol if appropriate.	☐ 1	☐ 2	☐ 3	☐ 4	61
34. Counsel patients with minor emotional disturbances.	☐ 1	☐ 2	☐ 3	☐ 4	62
35. Diagnose & treat acute otitis media.	☐ 1	☐ 2	☐ 3	☐ 4	63
36. Diagnose & initiate treatment for otitis media.	☐ 1	☐ 2	☐ 3	☐ 4	64
37. Examine ears with otoscope.	☐ 1	☐ 2	☐ 3	☐ 4	65
38. Dilate pupils.	☐ 1	☐ 2	☐ 3	☐ 4	66
39. Examine retina and optic discs.	☐ 1	☐ 2	☐ 3	☐ 4	67
40. Perform test of intra ocular pressure (tonometry).	☐ 1	☐ 2	☐ 3	☐ 4	68
41. Removal of foreign body from eye.	☐ 1	☐ 2	☐ 3	☐ 4	69

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Can perform quite adequately with little or no direct supervision.	Can perform quite adequately with some direct supervision.	Can perform quite adequately but close supervision is required.	Cannot perform. Task
42. Perform visual acuity.	1	2	3	4
43. Suture a laceration.	1	2	3	4
44. Remove suture.	1	2	3	4
45. Incise & drain abscess.	1	2	3	4
46. Strap or tape ankle, wrist, or knee for immobilization.	1	2	3	4
47. Set an undisplaced fracture.	1	2	3	4
48. Set a displaced fracture.	1	2	3	4
49. Reduction of shoulder dislocation.	1	2	3	4
50. Aspirate joint fluid from knee.	1	2	3	4

79 80

Part III

Below are listed a number of types of health-care personnel who might work in an ambulatory care facility. Please indicate how valuable you feel each role's contribution is to the mission of providing quality medical care to patients. For any role listed which you feel you do not have sufficient information to form an opinion, check the box marked, "Do not know/no opinion."

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Very valuable/ perform essential tasks	Valuable/ essential in some cases	Helpful but seldom perform essential tasks	Of secondary value/ sometimes helpful	Definitely not needed	Do not know/ no opinion	
a. Physicians	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	6
b. Nurses	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	7
c. Specialty Nurse (Midwife, Chronic Illness Nurse, etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	8
d. Nurse Practitioners/Nurse Clinicians	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	9
e. Physician Assistants	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	10
f. NAMICs/AMOSISTS	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	11
g. Corpsmen	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	12

Part IV: Career Orientation

The following questions relate to careers. We are interested in your perceptions of the career aspirations of your trainees.

	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent
1. To what extent do you view the new career of your trainees as promising intrinsic satisfaction from their work?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
2. To what extent do you perceive their new career as providing better than average rank/grade advancement advantages?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
3. To what extent can your trainees acquire in-service or continuing education as a result of their new careers?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
4. To what extent can their new careers help them get more formal degree granting education (e.g. beyond the B.S. or B.A. or the Associate of Science level)?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
5. To what extent will their new careers eventially lead to attractive job opportunities when they leave the military?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
6. In general, to what extent do you believe that your trainees will improve their career opportunities as a result of changing to the role they will fill after graduating from this program?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Part V : Personal Information

The following few questions are concerned with personal data and information about your military career.

1. What is your age? _____ years

2. What is your sex?

☐ 1. Female ☐ 2. Male

3. What is your present military rank?

☐ 1. E1 - E3 ☐ 5. O1 - O3

☐ 2. E4 - E6 ☐ 6. O4 - O6

☐ 3. E7 - E9 ☐ 7. O7 - O9

☐ 4. W1 - W4 ☐ 8. Non-military, Civilian

4. How long have you been in the military or associated with military health care?

_____ years (23-24) _____ months (25-26)

5. Which branch of the military are you in?

☐ 1. Army ☐ 5. Coast Guard

☐ 2. Navy ☐ 6. Non-Military, Civilian

☐ 3. Airforce ☐ 7. Other (specify) _____

☐ 4. Marines

6. How long have you worked in or with military health services?

_____ years (28-29) _____ months (30-31)

7. Right now, how much longer do you expect to stay in (or be associated with) the military?

_____ years (32-33) _____ months (34-35)

☐☐☐ (78 79 80)

Appendix 4.3

Questionnaires 3 (Q3)

For Physicians

Part I: Medical Role Description

For each of the following questions, please check the box or fill in the appropriate information which most accurately indicates your answer to the question.

1. What is your present medical role?

☐ 1. Physician

☐ 2. Other (specify) _____

2. In what medical specialty have you been trained?
(Please check only one box)

☐ 1. OB-GYN

☐ 2. Family Practice

☐ 3. Pediatrics

☐ 4. Surgery

☐ 5. Internal Medicine

☐ 6. Psychiatric

☐ 7. I have no medical specialty

☐ 8. Other (specify) _____

3. Does your present job involve you in providing direct medical care to patients?

☐ 1. No (if no, skip to Part II on page 3)

☐ 2. Yes (if yes, please answer the following questions)

4. How many patients do you see on an average day? _____

5. What percentage of your time is spent in face-to-face contact with patients?

_____ %

6. In your present job, how much of your time is spent dealing with the patients with each of the following medical needs?

	All of my time (95%-100%)	Not all, but a great deal (61%-94%)	A moderate amount of time (21%-60%)	A small, but significant amount of time (11%-20%)	Little or none of my time (0%-10%)	
a. Acute illness/injury	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	15
b. Chronic illness	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	16
c. Routine checkups	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	17

Part II: Medical Tasks

The following are 50 medical tasks which might be performed in an ambulatory care setting. We are interested in your ratings, as a medical professional, of the relative difficulty of the tasks listed. For each task, indicate the difficulty and level of skill required to effectively perform that task.

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Very little difficulty involved; little skill required	Slightly difficult task; some skill required	Somewhat difficult task; moderate skill required	Moderately difficult task; significant skill required	Very difficult task; very high level of skill required	
1. Measure and record height, weight, and blood pressure.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	18
2. Record the results of laboratory studies.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	19
3. Take and record complete medical history.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	20
4. Take ECG.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	21
5. Distinguish between normal and abnormal ECG.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	22
6. Take throat cultures.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	23

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Very little difficulty involved; little skill required	Slightly difficult task; some skill required	Somewhat difficult task; moderate skill required	Moderately difficult task; significant skill required	Very difficult task; very high level of skill required	
7. Evaluate and treat Strep throat according to protocol.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	24
8. Perform complete general physical examination for new patients.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	25
9. Perform physical examination with physician confirming heart & lung findings.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	26
10. Collect venous blood samples.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	27
11. Start intravenous fluids.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	28
12. Collect clean catch urine.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	29
13. Change foley catheters in male patients.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	30
14. Provide routine prenatal care.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	31
15. Counsel patients on family planning.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	32
16. Measure & record fetal heartbeat.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	33
17. Palpate uterus for fetal position.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	34
18. Pelvic exam for Cervical Dilatation.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	35
19. Deliver baby following uncomplicated pregnancy.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	36
20. Take pap smears.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	37
21. Perform routine pelvic exams.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	38
22. Teach breast self-examination to patients.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	39
23. Perform cardio pulmonary resuscitation.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	40
24. Percuss bladder for distension.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	41
25. Evaluate & treat diarrhea.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	42

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	Very little difficulty involved; little skill required	Slightly difficult task; some skill required	Somewhat difficult task; moderate skill required	Moderately difficult task; significant skill required	Very difficult task; very high level of skill required	
26. Evaluate & treat abdominal pain according to protocols.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	43
27. Evaluate & treat chest pain according to protocols.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	44
28. Perform rectal exam to evaluate prostate gland.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	45
29. Perform sigmoidoscopy.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	46
30. Evaluate & treat V.D. by protocol.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	47
31. Manage patients with chronic disorders according to standing protocols.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	48
32. Prescribe diabetic diets & adjust insulin dosage.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	49
33. Adjust medication for patient with hypertension according to protocol.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	50
34. Counsel patients with minor emotional disturbances.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	51
35. Diagnose & treat acute otitis media.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	52
36. Diagnose & initiate treatment for otitis media.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	53
37. Examine ears with otoscope.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	54
38. Dilate pupils.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	55
39. Examine retina and optic discs.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	56
40. Perform test of intra ocular pressure (tonometry).	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	57

Note: Read these answer choices over carefully.

Then answer each of the following questions by placing an X in the numbered box under the answer you want to give.

	1 Very little difficulty involved; little skill required	2 Slightly difficult task; some skill required	3 Somewhat difficult task; moderate skill required	4 Moderately difficult task; significant skill required	5 Very difficult task; very high level of skill required	
41. Removal of foreign body from eye.						58
42. Perform visual acuity.						59
43. Suture a laceration.						60
44. Remove suture.						61
45. Incise & drain abscess.						62
46. Strap or tape ankle, wrist, or knee for immobilization.						63
47. Set an undisplaced fracture.						64
48. Set a displaced fracture.						65
49. Reduction of shoulder dislocation.						66
50. Aspirate joint fluid from knee.						67

77 78 79 80

Part III

The following few questions are concerned with personal data and information about your medical career.

6-7 1. What is your age? _____ years

8 2. What is your sex?

☐ 1. Female ☐ 2. Male

9-10 3. How long have you been practicing medicine?

_____ years
9-10

11-16 4. Which of the following health care personnel have you had significant contact with in your medical practice over the past two years?

Yes	No	Indicate whether or not you have had significant contact with personnel in each of the following categories by checking the appropriate box.
11 ☐ 1	☐ 2	a. Nurses
12 ☐ 1	☐ 2	b. Physician Assistants
13 ☐ 1	☐ 2	c. Nurse Practitioners/Nurse Clinicians
14 ☐ 1	☐ 2	d. Chronic Illness Nurses/Extended Care Nurses
15 ☐ 1	☐ 2	e. AMOSISTS/NAMICS
16 ☐ 1	☐ 2	f. Corpsmen

☐☐☐
78 79 80

Appendix 5.1 Medical Task Complexity, Competence, Frequency

Coding of data:

Complexity = 1 = very easy 5 = very complex

Competency = 1 = can perform, no supervision 4 = cannot perform

Frequency = 1 = almost never perform 5 = quite frequently perform

Data given are mean and (std. dev.)
Tasks listed in order of increasing complexity

Medical Task No.	Complexity	Physician Frequency	Physician Assistant Frequency	Physician Assistant Competency	Nurse Practitioner Frequency	Nurse Practitioner Competency
1	1.125 (0.354)	2.30 (1.30)	3.11 (1.39)	1.00 (0.00)	3.08 (1.45)	1.00 (0.00)
2	1.250 (0.707)	2.56 (1.40)	3.62 (1.35)	1.21 (0.58)	3.18 (1.47)	1.00 (0.00)
6	1.500 (0.535)	2.58 (1.33)	3.41 (1.37)	1.07 (0.26)	3.23 (1.38)	1.00 (0.00)
12	1.750 (0.707)	1.17 (0.63)	1.42 (0.92)	1.00 (0.00)	2.11 (1.32)	1.00 (0.00)
4	1.875 (0.354)	1.33 (0.76)	1.52 (0.81)	2.64 (1.15)	1.24 (0.76)	2.00 (1.55)
42	1.875 (0.835)	1.64 (1.00)	2.81 (1.27)	1.00 (0100)	1.75 (1.21)	1.33 (0.82)
44	1.875 (0.641)	2.34 (1.35)	2.64 (1.35)	1.14 (0.36)	1.76 (1.05)	1.00 (0.00)
10	2.125 (0.641)	1.86 (1.04)	1.81 (0.98)	1.25 (0.45)	1.82 (1.18)	1.00 (0.00)
38	2.125 (0.641)	1.78 (1.11)	2.15 (1.17)	1.79 (1.12)	1.27 (0.78)	1.50 (1.22)
7	2.375 (0.744)	3.14 (1.48)	4.59 (0.78)	1.43 (0.85)	3.35 (1.65)	1.17 (0.41)

Medical Task No.	Complexity	Physician Frequency	Physician Assistant Frequency	Physician Assistant Competency	Nurse Practitioner Frequency	Nurse Practitioner Competency
11	2.500 (0.756)	2.25 (1.11)	2.10 (1.07)	1.57 (0.76)	1.69 (1.15)	1.00 (0.00)
13	2.625 (1.061)	1.19 (0.55)	1.18 (0.53)	1.69 (0.95)	1.03 (0.21)	1.00 (0.00)
20	2.625 (0.916)	2.46 (1.57)	2.50 (1.37)	2.00 (1.36)	2.66 (1.85)	1.50 (0.55)
46	2.714 (1.113)	2.16 (1.24)	2.85 (1.35)	1.43 (0.65)	1.64 (1.06)	1.00 (0.00)
30	2.750 (0.463)	2.95 (1.47)	4.15 (1.13)	1.57 (0.85)	2.50 (1.51)	1.17 (0.41)
43	2.750 (0.707)	2.67 (1.34)	2.94 (1.31)	1.50 (0.65)	1.43 (0.98)	2.50 (1.38)
37	2.875 (0.835)	4.42 (0.88)	4.90 (0.37)	1.14 (0.53)	3.93 (1.56)	1.00 (0.00)
14	3.000 (0.000)	1.76 (1.43)	1.44 (0.79)	2.43 (1.09)	2.16 (1.70)	1.50 (1.22)
22	3.000 (0.756)	2.64 (1.55)	2.89 (1.30)	1.57 (1.02)	3.23 (1.67)	1.00 (0.00)
35	3.000 (1.155)	3.77 (1.22)	4.69 (0.54)	1.43 (0.85)	3.33 (1.75)	1.17 (0.41)
36	3.000 (1.069)	3.64 (1.23)	4.62 (0.60)	1.43 (0.85)	3.25 (1.72)	1.17 (0.41)
45	3.000 (0.756)	2.61 (1.31)	3.04 (1.23)	1.93 (1.21)	1.47 (0.85)	2.67 (1.37)
3	3.125 (1.458)	4.05 (1.09)	4.34 (0.97)	1.43 (0.85)	4.03 (1.22)	1.00 (0.00)
24	3.125 (0.641)	2.44 (1.18)	2.97 (1.15)	1.29 (0.47)	2.38 (1.29)	1.00 (0.00)
16	3.143 (0.378)	1.71 (1.37)	1.38 (0.74)	2.00 (0.96)	2.17 (1.70)	1.00 (0.00)
31	3.143 (0.378)	3.04 (1.56)	3.72 (1.21)	1.93 (1.00)	2.95 (1.52)	1.00 (0.00)
47	3.143 (0.690)	1.65 (1.10)	1.79 (1.00)	2.23 (1.17)	1.03 (0.19)	3.67 (0.52)

Medical Task No.	Complexity	Physician Frequency	Physician Assistant Frequency	Physician Assistant Competency	Nurse Practitioner Frequency	Nurse Practitioner Competency
28	3.250 (0.463)	3.44 (1.48)	4.40 (0.75)	1.57 (0.94)	1.74 (1.30)	2.50 (1.64)
33	3.250 (0.463)	2.70 (1.65)	3.30 (1.41)	2.36 (1.01)	1.87 (1.48)	2.50 (1.64)
21	3.375 (0.744)	2.73 (1.57)	2.94 (1.35)	1.93 (1.27)	2.75 (1.85)	1.33 (0.52)
40	3.375 (0.916)	1.55 (1.04)	1.99 (1.13)	2.00 (1.24)	1.15 (0.62)	3.67 (0.82)
17	3.429 (0.787)	1.77 (1.38)	1.51 (0.85)	2.79 (0.89)	2.15 (1.70)	2.00 (1.55)
5	3.500 (0.756)	3.40 (1.41)	3.08 (1.05)	2.29 (1.07)	1.53 (1.02)	2.33 (1.03)
25	3.500 (0.926)	3.72 (1.17)	4.50 (0.63)	1.50 (0.85)	3.41 (1.51)	1.17 (0.41)
34	3.500 (0.535)	3.47 (1.24)	3.46 (1.11)	2.00 (0.96)	2.96 (1.28)	1.00 (0.00)
18	3.625 (0.518)	1.75 (1.38)	1.45 (0.78)	2.79 (1.05)	1.94 (1.54)	3.00 (1.55)
8	3.750 (0.463)	3.78 (1.31)	4.00 (1.24)	1.53 (0.83)	3.37 (1.68)	1.00 (0.00)
9	3.750 (0.707)	2.62 (1.77)	3.26 (1.54)	1.47 (0.83)	2.83 (1.59)	1.00 (0.00)
39	3.750 (0.707)	4.00 (1.12)	4.44 (0.79)	1.50 (0.85)	2.97 (1.56)	1.33 (0.52)
50	3.750 (0.463)	1.94 (1.17)	1.88 (0.95)	2.64 (1.08)	1.03 (0.19)	4.00 (0.00)
19	3.857 (1.069)	1.67 (1.37)	1.23 (0.58)	2.93 (0.92)	1.34 (1.10)	3.83 (0.41)
23	3.875 (0.641)	2.21 (1.11)	1.78 (0.93)	1.64 (0.93)	1.36 (0.78)	1.00 (0.00)
41	3.875 (1.126)	2.29 (1.17)	2.98 (1.18)	2.21 (1.25)	1.35 (0.77)	3.00 (1.26)
15	4.000 (0.756)	2.17 (1.42)	1.89 (1.00)	2.43 (1.09)	2.77 (1.75)	1.00 (0.00)

Medical Task No.	Complexity	Physician Frequency	Physician Assistant Frequency	Physician Assistant Competency	Nurse Practitioner Frequency	Nurse Practitioner Competency
26	4.000 (0.756)	3.52 (1.50)	4.53 (0.63)	1.86 (0.86)	3.39 (1.42)	1.17 (0.41)
49	4.000 (0.577)	1.53 (1.01)	1.55 (0.82)	2.86 (1.17)	1.01 (0.12)	4.00 (0.00)
32	4.143 (0.900)	2.89 (1.47)	2.16 (1.21)	2.79 (0.97)	1.67 (1.28)	3.00 (1.26)
29	4.375 (0.518)	2.26 (1.47)	1.64 (0.89)	3.00 (0.96)	1.02 (0.16)	4.00 (0.00)
27	4.500 (0.535)	3.26 (1.53)	4.43 (0.73)	1.86 (0.86)	2.55 (1.58)	1.67 (1.21)
48	4.571 (0.535)	1.42 (1.00)	1.36 (0.71)	3.14 (1.03)	1.00 (0.06)	4.00 (0.00)

Appendix 5.2

Mean Scores of the Most
Discriminating Variables by Commitment Category

a. Physicians

b. Nurse Supervisors

c. Nurses

d. Physician Assistants

e. Nurse Practitioners

f. Corpsmen

Appendix 5.2.a

Mean Scores on the Most
Discriminating Variables by Commitment Category

Physicians

Discriminating Variables[a]	Commitment Category Means			
	Active n=132	Passive n=26	Potential n=169	No n=219
1. Length of service	4.35	4.27	1.82	1.41
2. Command organization	3.80	2.64	3.41	2.33
3. Overall job satisfaction	4.40	3.50	3.79	2.28
4. Occupational commitment	3.18	3.45	3.70	3.92
5. Need for independence	2.86	3.15	3.38	3.80
6. Career enhancement	4.00	3.12	3.25	1.87
7. Job satisfaction (Hygienes)	3.98	3.33	3.31	2.33
8. Medical autonomy	1.53	1.68	1.70	1.86
9. Work communication	3.75	2.90	3.34	2.54

[a]Arranged in order of greatest discriminating power.

Appendix 5.2.b

Mean Scores on the Most
Discriminating Variables by Commitment Category

Nursing Supervisors

Discriminating Variables[a]	Commitment Category Means			
	Active n=157	Passive n=26	Potential n=17	No n=9
1. Length of service	5.43	5.35	3.18	3.11
2. Overall job satisfaction	4.41	2.73	3.82	2.11
3. Command organization	3.84	2.58	3.33	2.26
4. Administrative autonomy	2.07	2.39	2.60	2.80
5. Administrative formalization	3.30	2.71	3.12	3.19
6. Medical autonomy	1.91	2.27	2.19	2.22
7. Group performance	4.47	3.67	3.88	3.72
8. Need for independence	2.96	3.38	2.94	3.56
9. Job satisfaction (Motivators)	4.10	3.13	3.67	2.33
10. Job satisfaction (Hygienes)	4.24	3.33	3.74	2.97
11. Occupational commitment	2.85	1.91	3.01	3.47

[a]Arranged in order of greatest discriminating power.

Appendix 5.2.c

Mean Scores on the Most
Discriminating Variables by Commitment Category

Nurses

Discriminating Variables[a]	Commitment Category Means			
	Active n=75	Passive n=18	Potential n=36	No n=55
1. Command organization	3.66	2.72	3.78	2.34
2. Length of service	3.99	3.94	2.27	2.50
3. Occupational commitment	2.90	2.71	3.31	3.39
4. Job satisfaction (Hygienes)	4.18	3.31	4.00	3.19
5. Work communication	3.84	2.72	3.48	2.80
6. Need for independence	2.97	2.94	3.36	2.69
7. Career enhancement	3.87	2.67	3.69	2.83
8. Group performance	4.29	3.97	4.13	3.82
9. Need for leisure	4.15	4.33	4.47	4.44

[a]Arranged in order of greatest discriminating power.

Appendix 5.2.d

Mean Scores on the Most
Discriminating Variables by Commitment Category

Physician Assistants

Discriminating Variables[a]	Commitment Category Means			
	Active n=130	Passive n=48	Potential n=32	No n=31
1. Length of service	5.35	5.40	3.65	3.63
2. Command organization	3.44	2.28	3.13	2.63
3. Career enhancement	3.95	2.71	3.42	2.47
4. Occupational commitment	3.26	3.25	3.46	3.79
5. Job satisfaction (Hygienes)	3.33	2.45	3.06	2.52
6. Work communication	3.68	2.67	3.37	2.96
7. Overall job satisfaction	4.42	3.19	3.97	3.34
8. Administrative formality	3.15	2.74	2.98	2.99
9. Group performance	4.32	3.99	4.19	3.77

[a]Arranged in order of greatest discriminating power.

Appendix 5.2.e

Mean Scores on the Most
Discriminating Variables by Commitment Category

Nurse Practitioners

Discriminating Variables[a]	Commitment Category Means			
	Active n=157	Passive n=31	Potential n=46	No n=57
1. Command organization	3.59	2.43	3.48	2.46
2. Length of service	4.13	4.42	2.54	2.80
3. Job satisfaction (Motivators)	4.40	3.72	4.04	3.61
4. Administrative formality	3.13	2.78	2.82	3.02
5. Need for leisure	4.18	4.06	4.39	4.26
6. Career enhancement	4.10	2.84	4.07	3.28
7. Need for independence	3.57	3.23	3.33	3.59
8. Job Satisfaction (Hygienes)	4.19	3.44	3.88	3.58
9. Occupational commitment	3.37	3.30	3.43	3.57
10. Work communication	3.62	2.58	3.58	2.81

[a]Arranged in order of greatest discriminating power.

Appendix 5.2.f

Mean Scores on the Most
Discriminating Variables by Commitment Category

Medical Corpsmen

Discriminating Variables[a]	Commitment Category Means			
	Active n=319	Passive n=86	Potential n=210	No n=189
1. Length of service	4.50	4.41	1.98	2.12
2. Command organization	3.50	2.33	3.31	2.44
3. Job satisfaction (Motivators)	3.97	3.12	3.89	3.01
4. Overall job satisfaction	4.23	2.99	4.33	3.19
5. Occupational commitment	2.81	2.92	3.22	3.25
6. Career enhancement	3.87	2.52	3.85	2.74
7. Administrative autonomy	2.38	2.91	2.59	2.76
8. Work communication	3.68	2.67	3.52	2.89
9. Need for leisure	4.03	4.05	4.28	4.11
10. Medical formalization	3.33	3.02	3.33	2.99
11. Need for independence	3.23	3.63	3.35	3.44
12. Job satisfaction (Hygienes)	3.76	2.98	3.60	2.89
13. Group performance	4.29	3.80	4.09	3.83
14. Medical autonomy	2.21	2.57	2.21	2.37

[a]Arranged in order of greatest discriminating power.

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